Arcana Microcosmi:

OR,

The hid Secrets of MAN's Body discovered;
In an Anatomical Duel between *Aristotle* and *Galen* concerning the Parts thereof:

As also,

By a Discovery of the strange and marveilous Diseases, Symptomes & Accidents of MAN's BODY.

WITH

A Refutation of Doctor *Brown*'s

VULGAR ERRORS,

The Lord BACON's

NATURAL HISTORY,

And Doctor *Harvy*'s Book

DE GENERATIONE,

COMENIUS, and Others;

Whereto is annexed a Letter from Doctor *Pr.* to the Author, and his *Answer* thereto, touching Doctor *Harvy*'s Book *de Generatione.*

By *A. R.*

London, Printed by *Tho. Newcomb*, and are to bee sold by *John Clark*, entring into Mercers-Chappel, at the lower end of *Cheapside*, 1652.

TO THE WORSHIPFUL and my much honored FRIEND, *EDWARD WATSON*, ESQUIRE,

Son and Heir to the Right Honorable, the Lord ROCKINGHAME.

SIR.

WHen I consider your proficiency in the Schoole of Wisdome, your daily exercises in the Temple of Vertue, for which you may in time deserve a Shrine in the Temple of Honor; your hearty affection to true and solid Philosophy; not that which the Apostle calls Vain and deceiving; *and lastly, your sincere love to me, I thought good not in way of retaliation, but of a thankfull recognition of your favours, to present this piece to you, wherein you may perceive how many strange wonders and secrets are couched up within the Microcosme of our body; and with what admirable artifice the base and infirm materials of this our earthly Tabernacle are united and composed.*

Likewiſe you may ſee how much the Dictates and Opinions of the ancient Champions of Learning, are ſleighted and miſconſtrued by ſome modern Innovators; whereas we are but children in underſtanding, and ought to be directed by thoſe Fathers of Knowledge: We are but Dwarfs and Pigmies compared to thoſe Giants of Wiſdom, on whoſe ſhoulders we ſtand, yet we cannot ſee ſo far as they without them: I deny not but we may and ought to ſtrive for further knowledge, which we ſhall hardly reach without their ſupportation. I diſſwade no man from inventing new; but I would not have him therefore to forget the old, nor to loſe the ſubſtance whilſt he catches the ſhadow. Women and Children love new wine, becauſe pleaſant to the palat; but wiſe men chuſe the old, becauſe wholſomer for the ſtomach. As I abridge no man of his liberty to invent new wayes; ſo I hope they will not debar me of the like liberty to keep the old paths, ſo long as I find them more eaſie and compendious for attaining the end of my journey. Sir, I will not trouble you with any larger Diſcourſe on this ſubject. I wiſh an accumulation of all vertue and happineſſe on you, and withall the continuation of your love to him who profeſſeth himſelf

Your humble ſervant,

Alexander Roſs.

The Contents of each Chapter in theſe foure Books.

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Arcana Microcosmi:

OR,

The hid Secrets of MAN's BODY discovered.

WITH

A Refutation of Doctor BROWNS VULGAR ERRORS,

My Lord BACON's *Naturall History;*

AND

Dr HARVEY's Book *De Generatione.*

CHAP. I.

1. *The Hearts dignity, scituation, priority, necessity, and use.* 2. *The Heart first formed, not all the parts together.* 3. *The* Galenists *Objections answered.* 4. *How the heart is perfect before the other members, and how nourished.* 5. *All the temperaments united in the Heart.* 6. *Three ventricles in som Hearts.* 7. *The Heart nervous.* 8. *No parts more spermatical then others.* 9. *The Liver, not the first that is formed.* 10. *The Heart the seat of Bloud and nourishment.* 11. *The heat of the Matrix not generative.* 12. *The right Ventricle nobler then the left.* 13. *The vital and nutritive faculties are the same.* 14. *Heat the cause of the Hearts motion.* 15. *The Heart was first formed and informed.* 16. *There is but one principal member in the body, not many.*

AS in all States and Kingdomes there have ever been factions and sidings, so have there been still oppositions in the Common-wealth of Learning; amongst many others, there are two great factions concerning the fabrick of Mans Body; namely, the *Peripateticks* and *Galenists*; so that in *Rome* there was not greater emulation between the *Pompeians* and *Cæsarians*, then there is between the *Philosophers* and *Physitians*

ſitians in the points of Anatomy: I ſtood as neuter a long time, but at laſt being evinced by the multitude and ſtrength of *Ariſtotelian* reaſons am forced to ſide with them againſt the *Galeniſts*; but ſo, that I do what I can to reconcile them in ſome things, and to make peace; for, *Nulla ſalus bello.*

I. I will therefore briefly ſet down the reaſons that have induced me to ſide with the *Ariſtotelians*. And firſt concerning the Heart: I finde that it is the firſt member that lives and is formed in our bodies; and conſequently the nobleſt and chiefeſt of all our members, whatſoever the *Galeniſts* ſay to the contrary. For 1. The Heart is placed in the midſt of the breaſt, as the Sun in the midſt of the world, that it might impart its vital heat and motion to all parts: So the ſeed is in the midſt of the fruit. 2. Where there is a *medium* there muſt needs be *extreams*; but we finde in mans body this *medium*; to wit, that there are ſome parts which both give and receive life and motion; therefore there muſt be ſome that receive but give not; and conſequently ſome that give but receive not; and this muſt be the heart, or brain, or liver: for to make more originals then one, is needleſs, ſeeing Nature always tends to, and aims at unity. Now that the heart is this principal, appears by theſe reaſons. 3. Firſt, that is moſt likely to be the originall of life, ſenſe, and motion in other members, which is moſt apt and capable of theſe; and ſo, that had firſt life and motion, which had the greateſt inclination and aptitude to receive them; but the heart of all other parts is moſt apt to receive theſe from the formative faculty: Therefore doubtleſs this faculty in the ſeed, would firſt produce the heart, as being a matter prepared to receive firſt the impreſſions of the formative. 4. What the heart is in Animals, that the root is in Vegitables; but the root is the firſt thing the plant thruſts out; therefore the heart is firſt formed. 5. The heart dieth laſt, therefore it lived firſt: for this method Nature obſerves, that the parts which are laſt made, decay firſt, as the eies and teeth; and conſequently that decayeth laſt, which was framed firſt. 6. They that have been curious by inſpection into eggs, to obſerve Natures progreſs in the generation of the chick, have found a red ſpot the third day, which had a motion like palpitation; this could be nothing elſe but the heart. 7. The other members cannot live without the heart, but the heart can live without the other members, as I have ſeen a Monkeys heart live a great while after it hath been taken out of the body: If then the life of the other members depends from the heart,

and

and not the heart from them, the heart muſt needs be the firſt that liveth.

8. The heart imparts the vitall heat to the other parts, it muſt therefore have exiſtence before the other parts; for operation follows the exiſtence. 9. The formative power of the ſeed doth not operate but by the vital heat of the heart; therefore this muſt be firſt, before that can operate. 10. The matter cannot be diſpoſed, to receive the form of the members, nor can the parts be diſtinguiſhed one from another, without the heat and motion of the heart. 11. Nature in her operations aims at an end; but where there is an end, there is order; and where there is order, there is priority, and ſomething that was firſt.

II. There are ſome who hold that the heart is not firſt generated, but that all the members are at the ſame time begot and formed together: But this cannot be ſo; for in the Embryo we ſee that all the parts are not equally articulated and figured, but ſome ſooner, ſome later. 2. We ſee this in art, which imitates Nature; for the artificer carves and figures one part before another. 3. We ſee the teeth are begot long after the other parts; for nature produceth the members as there is uſe of them; the infant needs no teeth whilſt it feeds on milk. 4. If all the parts are at the ſame time framed and articulated, then all the body is at the ſame time perfected; but this is not Natures work, which proceeds by degrees to perfection, having imperfect beginnings.

III. The *Galeniſts* object, that Nature had to no purpoſe made the heart before the reſt of the body, ſeeing there is no uſe of the heart till the body be formed. I anſwer, there is a two-fold uſe, namely, of Animation, and of preparation; the heart could not animate the body before it was, but it could prepare the matter by its vital heat and motion to receive the impreſſion and influence of the formative power, working by the heart on the matter; the heart then is uſefull, not only to the body after it is generated but alſo whilſt it is in *Fieri*; and in generation, the heart is the foundation of the whole corporeal Fabrick; we cannot ſay the foundation is needleſs, becauſe it is laid before the houſe is built; for though it doth not ſupport the ſuperſtructure before it be, yet it is ready and fitted to ſupport it, when it ſhal be: Neither will it follow, that becauſe the houſe before it is built needs no foundation, therefore the foundation muſt not be firſt laid. There is need of priority and order; the building needs it, when it ſhall

be, and the builder needs it before it be: though the body not yet formed needs not the heart, yet the formative power needs it. Secondly, they object that the formative power is common to all the parts alike, having no more relation to one then to another; and therefore works upon them all alike, and produceth them together. I answer, God is the common and universal cause of all his creatures; yet he did not create them all in one day; the universality of the cause, excludes not the order of casuality; nor is the common relation it hath to the effects, any reason of producing them all at one time. Again, though the formative power hath an equal relation to all parts, as they are parts; yet it hath a nearer relation to the heart, as being its organ, by which it works on the other parts.

IV. If it be asked whether the heart be perfect or imperfect before the other members be articulated. I answer; It is perfect, if it be compared with any other member, but imperfect if compared with the whole *compositum*. Again, it is imperfect to what it shal be, when it shall be fitted with all necessary Organs for animation. 2. If again it be asked, how the heart can live without nutriment, seeing the liver by blood feeds it. I answer, though the liver be not yet formed, yet the heart is nourished by some adjacent matter, as the chick is by the yeolk of the egg; and this nourishment sufficeth the heart, till blood, a perfect nutriment be prepared. Again, the nutritive faculty doth not flow from the liver, as the vitall from he heart, but it is inherent and implanted into every part, as well in the heart as in the liver; whereas the vitall is implanted only in the heart, and from thence flowing into every member. Lastly, we may say that the heart needs no food, till there be a dependition, or wasting of its substance.

V. The unity of the vegetive soul cannot be preserved in so many different temperaments; or the body, (for there are as many as there are parts) if it were not for the common temperament of the heart, in which all the others are united, receiving from thence heat and spirits: It was needfull then that the heart should be first formed, as being the common originall of all the other parts, all which may be said to have but one common temperament, and one soul, because there is but one heart.

VI. Though the *Galenists* affirm that the heart hath but two ventricles; yet the *Aristotelians* in affirming three in bigger creatures, seem to speak more reason: For if in bigger animals there is greater store of spirits, and a greater elaboration of them,

them, then in the leſſer, it ſtands with reaſon that their hearts being bigger, ſhould have alſo more receptacles for containing the vitall blood and ſpirits, then the leſſe.

VII. It ſtands alſo with reaſon, that the ſubſtance of the heart is nervous, that it might be the more firm and ſolid. 2. *Becauſe* the heart is the original of motion, which is performed by the nerves. 3. Becauſe the ſubſtance of the veins and arteries, whereof the heart is the originall, is nervous.

VIII. The parts which the *Galeniſts* call Spermaticall, are not made of the *Sperma*, or Seed, more then any other parts are, but of the dryer and more ſolid parts of the blood, as the Sanguineall are of the thinner parts thereof. 2: The males ſeed is onely active, the woman hath no other ſeed then the menſtruous blood, which is meerly paſſive; in both which ſeeds there is a power or potentiality of generation; the active in the male, the paſſive in the female, both which are from the heart. In this alſo I ſubſcribe to *Ariſtotle.*

IX. I cannot aſſent to the *Galeniſts*, in affirming the liver rather then the heart to be the firſt that lives in us, and therefore the original of other parts, becauſe it is bigger, and nearer to the matrix, then the heart; for the *Ariſtotelians* ſay well, that the original of things conſiſteth not in bulk, but in vertue; the ſeeds of trees and plants are leaſt in bulk, and yet are the originals of great bodies. 2. The vicinity to the matrix is not the cauſe of priority; for the matrix is the place of, but not an agent in generation; the agent is only the formative faculty in the ſeed.

X. Both *Ariſtotelians* and *Galeniſts* affirm, that the child at firſt lives the life of a plant; but from hence the *Ariſtotelian* concluds, that the heart is the firſt members begot in us, becauſe it is anſwerable to the root in plants, which is firſt generated; but the *Galeniſt* infers, that the liver muſt be the firſt member, becauſe the child living the life of a plant, hath no other faculty but nutritive, which is the faculty of the plant, the ſeat whereof is in the liver. But here I ſide with *Ariſtotle*, becauſe the liver is no more the ſeat of nutriment then the heart: And becauſe the heart is as the root; but it is by the root the plant lives and is nouriſhed: And if the liver be the ſeat of nutriment, becauſe of the blood thereof; I ſhould rather ſay the heart is this ſeat, becauſe we finde blood there out of the veins, as in a ciſtern; but in the liver there is no other Blood, then what is in the veins: Neither can the liver be the originall of the nutritive power, becauſe there is the ſenſe of

indigence

indigence or want; for ſo the ſtomack ſhould rather be this originall, becauſe there is the moſt exquiſit ſenſe of want.

XI. The liver cannot be generated without heat and ſpirits; but the ſeat of heat and ſpirits is the heart, therefore this muſt be firſt. If any will ſay that the heat of the matrix is ſufficient; I deny it; for that heat is onely conſervative, not generative; it hardeneth and conſolidateth the outward parts, but doth not produce the inward.

XII. *Ariſtotle* will have the right ventricle of the Heart the nobler; *Galen* the left; but I ſubſcribe to *Ariſtotle*; becauſe I finde that the right Ventricle liveth longer then the left. 2. That the Pulſe in the right ſide of him that is dying, is more valid then in the left ſide. 3. The right ventricle leans upon the lungs as upon a Cuſhion or ſupporter, Nature ſhewing as it were, a greater care of this then of the other. 4. The right parts are nimbler and ſtronger then the left, becauſe they are hotter. 5. Though the ſpirits receive their completion in the left ventricle, yet they are prepared and fitted in the right; and therefore there needs not ſo great a heat in the left ventricle, as the *Galeniſts* ſpeak of; for a moderate heat will ſuffice to perfect that which is already begun. 6. The left ventricle is but a ſervant to the right, in finiſhing that work which was begun by the right, and diſtributing it into the body, being finiſhed.

XIII. The *Ariſtotelians* make the vital and nutritive faculty the ſame; the *Galeniſts* make them diſtinct; but the *Peripateticks* reaſon prevails with me, which is this; That where there are diſtinct faculties, there muſt be diſtinct operations, becauſe the facuſty is for the operation; But there are no diſtinct operations of the vital faculty, from that of the nutritve; for accretion, diminution, and generation are actions of the vital or nutritive: Senſe and motion are actions of the animal faculties. 2. Life is the preſence of the ſoul in the body; this preſence conſiſts in action, this action is nutrition; for when this action fails, life fails; becauſe the chief and firſt action of the living creature is to preſerve it ſelf, which cannot be without nutrition; ſeeing nutrition is not without tact in the ſenſitive creature; but when tact faileth, animality muſt needs fail.

XIV. The *Ariſtotelians* make heat the efficient cauſe of the hearts publick motion: Others will have the ſoul; Others, the vegetive faculty; but *Ariſtotle* is in the right; for the ſoul works by its faculties, and theſe by heat; ſo that heat is the immediate cauſe of this motion, and the ſouls inſtru-

ment

ment; yet not such an instrument as worketh nothing but by the force of the principal agent; for the heat worketh by its own natural force, though it be directed and regulated by the soul; the heat then of the heart rarifying the blood into vapors, which require more room, dilate the heart; but by expelling some of these vapors into the arteries, and receiving also some cold air by the lungs, the heart is contracted, this is called *Systole*, the other *Diastole*: And as heat is the efficient cause, so it is also the end of this motion. For therefore doth the heat move the heart, that it by this motion might impart heat to the body. But I understand not here by heat, a bare quality, but that which is called [*Calidum innatum*] If it be objected, that there is in Plants a vegetive faculty and heat, but not this pulsifick motion, nor yet in effects. I answer; the reason is, because there are not instruments fit for such a motion, nor is there any use of it. 2. This motion of the heart is local not totally, but partially; for not the whole heart, but the parts thereof change their place or seat, and so in this regard augmentation and diminution are local motions.

XV. That the heart is not only first formed, but is also first informed, and first exerciseth the action of life, is plain by this reason drawn from the *Peripateticks*: the heart was made at first an Organical member; but that could not be, if it was not first informed by the soul, which is the first act of the organical body: and if it was made organicall, it had been made to no end, and nature had been idle, to have made an useless member, which could no more deserve the name of heart, then a blinde eye, the name of eye: But the soul that I speak of here, is the vegetive or sensitive resulting out of the matter, which is first prepared in the heart for reception of it; and not the reasonable soul, which with all its perfections is created and infused by God, into the whole body after it is articulated, and made capable of such a noble Guest.

XVI. The *Aristotelians* are more rational in placing but one principall member in the body, then they who place either three or four: For it is nedless to make so many principals, when as one will suffice: Nature aimeth always at unity; for all the five senses are united in one common sense; all the members in one body; all the different specificall parts of the world into one common nature; so all the members into one heart, which hath in it the natures of all, or their temperaments: Nor could the soul being but one, work upon so many

ny different temperaments, if they were not united into one temperament: Beſides, we ſhould be forced to run *in infinitum*, if we ſhould hold more principles then one; for avoiding of which inconvenience, we muſt ſtay in one chief principle. If it be objected, that the nerves, veins and arteries are of different temperaments, therefore muſt proceed from different principles. I Anſwer, that from one principle in which divers temperaments are united, may iſſue different temperatures. 2. I denie that the temperature of the veins, nerves and arteries are different, otherwiſe then *Secundum magis, & minus.*

CHAP. II.

Blood begot in the Heart, not in the Liver, why? 2. The Heart is the original of the Veins and Nerves, of nutrition, and ſenſe, and motion. 3. Why the nerves and veins do not beat, and the cauſe of Hydropſies. 4. All blood is not elaborated in the heart; how it is the original of the veins. 5. The arterial blood muſt waſte, or elſe it would infinitely increaſe. 6. Why the blood thickneth not in the heart till death. 7. The heart is the ſeat of paſſion. 8. Why the heart a fitter ſeat for the ſoul then the liver. 9. A double unity, to wit, of the matter, and of the form.

I. IF blood were begot in the liver, there ſhould be ſome Cavity in it, that the blood there might be concocted, and receive its form; for in the ſtomack, Heart, Gall, bladder, *&c.* there are ſenſible cavities for generation and reception of the *Chylus*, vital blood, choler, urine, *&c.* but in the liver there is no ſuch receptacle; and to ſay that the blood is begot in the ſubſtance of the liver, is to make penetration of bodies: Therefore it is more likely, according to *Ariſtotle*'s Doctrin, That blood is begot in the heart. If it be objected, that if blood were not begot in the liver, to what end did Nature faſten the gall-bagg to the liver, if it were not to purge the blood, and receive its excrementitious choler, as the ſpleen doth its melancholy? I anſwer, The gall and ſpleen do not purge the blood made by the liver, but that matter which was to be prepared by the liver, for the heart; the heart then makes the blood, which was prepared by the liver, and purged by the gall and ſpleen, that the matter might be the fitter to receive the form of blood in the heart, being purged before from its groſs humors.

II. Becauſe the heart is the original of the nutritive and auctive

auctive faculties; it must also be the original of the veins, through which these faculties are conveyed through the whole body. The liver then hath not so much heat as is requisite for nutrition, auction, and generation; Therefore the original of these must be in the heart, which is the fountain of heat. 2. And because the heart is the seat of Passions, it must be also the original of sense and motion, without which there can be no passion; and consequently it must be the first organ of the nerves. 3. The heart and veins have the same essential form, which is nutritive or vitall; the same essential work and end also which is to nourish the body, or to give it life and vegetation. The like may be said of the nerves; therefore it must follow, that the matter of the heart, veins and nerves is the same; and that from the heart they have their beginning.

III. The *Galenists* will not have the heart the originall of the nerves and veins, because they do not beat, as the arteries do, which they grant proceeded from thence; but rather will have the liver to be the original of them, as also of blood, because when the liver is corrupted, sanguification fails, and so arises Hydropsies. I answer; though the nerves and veins arise from the heart, yet they beat not, as the arteries do, because the blood in the veins is grosser, less hot, and spirituous then that in the arteries; and the nerves beat not, because they have not those fumes which by the motion of the arteries must be expelled; their heat also is tempered by the frigidity of the brain; and if there were any motion in the nerves, it could not be so easily discerned, because of the thickness of the nerves, and their lying deeper within the body; as for Hydropsies, they are caused, not because the liver doth not sanguifie, but because it doth not prepare fit matter for the heart to sanguifie. And indeed, if the liver did sanguifie, the Hydropick would presently die upon the cessation of that action; for life cannot subsist without nutrition, nor this without sanguification. Therefore doubtless in Hydropsies, the heart being sound, converts some part of that inconcocted matter into blood, which the corrupted liver could not prepare; and by this means the hydropick lives a while.

IV. All the blood in the veins is not elaborated in the heart, but only that portion which is by the arteries distributed into al parts of the body; and hath a formative power over the veinal blood. The heart blood then is not conveyed by the (*Vena cava*) into the body; but by the arteries. 2. When the heart is called the

the original of the veins, we do not mean, the efficient cauſe, for that is the formative power joyned to the heart; but the place in which they are formed: And there is no place ſo fit for this generation, both of blood, veins, and other parts, as the heart; becauſe it is the fountain of heat, whoſe action is the firſt, and the moſt common of all actions in the body; for without the action of heat, there can be neither nutrition, motion, ſenſation, nor underſtanding, as it works by the phantaſie.

V. If the arterial blood were not the nutriment of the body, and ſo waſted, being converted into the ſubſtance of the body, what becomes of it all, it muſt infinitely increaſe, being it is continually generated, and not waſted; neither can the veinal blood nouriſh, but as it is perfected, and receives its form, by and from the arterial blood.

VI. That the heart is the proper ſeat of the blood, appears by this, that the blood never thickneth in the heart, as it doth in other places, being out of the veins. But whereas the blood is found curdled in the heart of dead bodies, and thin in the veins of the liver, it is plain that the blood had received its full concoction and perfection in the heart, but not in the liver, as being not ſo fibrous, and therefore more thin and watriſh.

VII. Becauſe the heart is the ſeat of paſſions and appetite, it follows that it muſt be alſo the ſeat of ſenſation; for without this there can be no appetite in the ſenſitive creature; and if of ſenſation, then alſo of nutriment, for the ſenſitive includes the nutritive faculty; and if it be the original of the nutritive, it muſt be alſo of blood, by which we are nouriſhed, and conſequently of the veins which conveyeth the blood, chiefly of *Vena Cava*, which ariſeth from the ſuperficies of the heart; and ſo faſtned to it, as to its principle, that it cannot be parted from it.

VIII. Becauſe the heart is an organical body, being diſtinct into divers diſſimular parts, it is a fitter place for the ſoul then the liver, which is altogether ſimular, ſeeing the ſoul is the act of an organicall body: and therefore the nutritive faculty muſt be rather in the heart then the liver; and though ſenſation be by the ſimular parts, yet motion requires diſſimular and organicall parts, becauſe divers bendings and turnings require divers organs.

IX. All ſenſitive creatures have a double unity; to wit, of the matter, and of the form: The unity of the matter conſiſts

ſists in the unity of the parts and temperaments, which is to be found in the heart onely; the unity of the form conſiſteth in the ſenſitive ſoul, containing in it the vegetive and the particular forms of each part.

CHAP. III.

Why the heart the original of ſenſation, and how it feeleth. 2 The brains being cold cannot beget ſenſative ſpirits: Why the animal ſpirits moſt active where is moſt heat. 3. There can be no generation of the animal ſpirits out of the vitall, without the corruption of the vitall, which is impoſſible: The animal ſpirits are not begot of the aire. 4. Neither are they concocted or generated in the ventricles of the brain, nor are they waſted. 5. The brain is not the originall of ſenſe and motion, although theſe fail upon the hurt of the brain. 6. Why upon the diſtemper of the heart, there is no failing of ſenſe and motion. 7. The nerves are not from the brain, though they be like; but indeed they are not like the brain. 8. Why the nerve of the heart loſeth ſenſe and motion beneath the knot, not above it. 9. The brain is the coldeſt of all the parts? how void of veins and blood, how hot, and the cauſe of hairs. 10. The blood and ſpirits alter not the brains temper. Why its coldneſs is not felt: the pith in the back bone hot. 11. Why the brain and heart at ſuch a diſtance: by the ſpirits they work on each other. 12. Why both the brain and lungs were made for refrigeration. 13. The mans brain larger then the womans: why man hotter then Lions. 14. The teſticles ignobler then the heart and brain. 15. The heart, not the teſticles, the cauſe of ſenſation and generation; the teſticles not chief becauſe neceſſary, or becauſe they cauſe an alteration in the body, from whence is the diſtinction of ſexes. 16. The ſeed receiveth its ſpecificall form from the heart. 17. Why Eunuchs fatter, weaker, and colder.

THough the organs of ſenſe be in the brain, yet the originall of ſenſation is the heart, becauſe it is the originall of the ſpirits, the chief cauſes of ſenſation, and without which the organs were no organs: But the frigidity of the brain is not the cauſe of ſenſation, nor of the ſenſitive ſpirits; it only tempers the heat of the heart and vital ſpirits, that they may become animal. Neither is ſoftneſs and hardneſs any thing to ſenſation, ſeeing this is no material but a ſpiritual and perfective quality. Now the heart is ſenſitive, not by the animal ſpirits derived

derived thither from the brain; for theſe ſpirits in the heart would quickly loſe their temper, by reaſon the heat of the heart is a more active quality then the coldneſs of the brain; but it feeleth by its own ſpirits, whether we call them vital or animal, or both. For the ſpirits being turned from vital to animall, receive only an alteration, but not a ſubſtantial change. For that only is in the aliments, which is tranſubſtantiate into our bodies.

II. The brain being cold and moiſt, uſeth to convert ſuperfluous vapours into thoſe humours which moſt reſembleth it ſelf in theſe qualities, to wit, into watriſh Catharrs, and cold diſtillations: therefore it is likely that the brain can transform the vital ſpirits into other more excellent then themſelves; eſpecially ſeeing coldneſs is a quality hurtful to nature, which conſiſteth in heat and moiſture, and hath no other uſe in our bodies, but to condenſat and to temper the activity of our natural heat; therefore we finde the animal ſpirits moſt active and copious in thoſe creatures that abound moſt in heat, as in Men, Lions, Birds, *&c.* and in young men more then in old men.

III. If there be a ſubſtanital mutation of the vital ſpirits into the animal, the generation of the one muſt be the corruption of the other; and ſo the vital ſpirits muſt die, that the animal may receive the eſſential form. But how can the animal ſpirits ſubſiſt without the vital? Or how can that be called an animal or ſenſitive creature, whoſe vital ſpirits are dead, ſeeing there can be no ſenſe where there is no life, nor life where the vital ſpirits are dead? 2. The animal ſpirits are not generated of the aire, which we draw in by breathing; for there can be no generation without mixtion, nor mixtion but of divers bodies: Now the aire is but one ſimple body, which cannot make a perfect mixtion without the other elements. If it be objected, that the air is impure, and not ſimple, I anſwer, Though the aire be not pure, yet it is not a mixed body Phyſically and properly, but only by appoſition, as Wheat and Barley may be ſaid to be mixed when they are joyned together, which is no Phyſical mixtion, wherein the elements loſe their forms.

IV. The animal ſpirits cannot be generated in the ventricles of the brain, becauſe there the excrementitious flegme is concocted: Nor can they be ſaid to receive concoction there, ſeeing what is concocted is thickned, but the animal ſpirits are attenuated: now the cold brain is not fit to attenuate. Again,

seeing there is continual use of the animal spirits, they must be continually generated; but if they be continually generated, and never wasted, where will there be room enough for them? And that they are not wasted is plain, because they are not consumed by nutrition, as not being fit to nourish; nor by sensation, seeing this is a spiritual and perfective not a material or destructive act. Nor lastly by transpiration; for nothing is exhaled but excrements. Lastly, how can the brain be without feeling, seeing it is full of sensitive spirits, by which all other parts of the body feel?

V. When the brain is hurt and distempered, there followes a defect in sensation and motion, which is not a sufficient reason to prove that the nerves, sense, and motion have their original from the brain; no more then that the brain should have its beginning from the stomach, or other nervous parts: for we know that the mouth of the stomach being hurt, the brain by consent is made ill affected by reason of the sympathy and union of the nervous parts: so motion is hindred upon the ill affection of the brain, because of the many nerves united to the brain and back-bone: the brain then is not the principal agent of sense and motion, but instrumental onely, in that by its frigidity it tempers the vital spirits, and so makes them apter for sense and motion: so upon the defect in the pen, followes the faults in writing; and yet not the pen, but the pen-man, is the chief agent in writing.

VI. The reason why upon the distemper of the heart, sensation and motion do not cease, as they do upon the distemper of the brain; because though the heart be distempered, yet it makes spirits, which spirits being refrigerate by the brain, and conveyed through the nerves, cause sensation and motion, which could not be if the brain were hurt, this being the immediate agent and instrument, without which the heart doth not operate in sensation.

VII. To conclude the nerves to have their originall from the brain, because of their similitude, is a weak argument: For 1. Many children are not like their parents from whom they have their originall, but like strangers many times, to whom they have no relation. 2. There is no similitude between the brain and nerves; for that is soft and moist, these hard and dry. 3. Nor is the nerve in its medullary part like the brain; for this is cold, the marrow is hot. 4. If the nerves are from the brain because their inward parts are soft and marrowy, then the bones should be derived also from the

brain

brain, for they have much more marrow in them. 5. If the nerves are from the brain because they have two tunicles, as it hath; by the same reason let the Arteries also have their beginning from thence; for these also are double tunicled. 6. All nerves have not this medullary substance within them.

VIII. Though the heart hath but one little nerve, which being tied, looseth its sense beneath the knot, but above retains it; though this, I say, be so, yet from hence it cannot be proved, that the brain is the originall of the nerves, or of sensation; but rather the heart; for the upper part of the nerve is sensible, because it is joyned with other nerves, whereas the lower part is joyned to none. 2. The spirits in the upper part are tempered by the frigidity of the brain, whereas the lower part hath no refrigeration; and though the faculty or power of sense is from the heart, yet the act of sensation is not exercised without a temperate heat, or refrigeration. 3. I think this is rather a conjecture of the *Galenists*, then an experiment: for who did ever find this nerve in a living creature.

IX. *Aristotles* reasons for the coldnesse of the brain, are to me not improbable, or easie to be answered: for if the brain were hot, we should never sleep, seeing coldness causeth sleep. 2. There are more moist humors and flegme ingendred in the brain, then any where else. 3. There is not blood in the brains, as in other parts of the body; for it is the blood that warms the body. I say there are not veins incorporating themselves into the substance of the brain, and terminating there, as they do in the flesh and skin; which is the cause that every part of the flesh or skin being pricked, bleeds; so doth not the brain, whose substance is white and bloodless; therefore though there be veins in the brain, yet they are distinct from the substance of the brain, and not ending in them; neither is that heat which is in the brain, its own, but adventitious and externall, to wit, of the arteries and veins, as also of fumes and vapours: so then the brain is the coldest of all the parts of mans body, yea colder then the bones, because the bones are dry, the brain moist: but cold with moisture is greater effectively then with siccity, so the water is colder then the earth. If it be objected that the brain is hot, because the head is more hairy then any other part of the body, and because the brain stands continually in need of ventilation by the nostrils, and transpiration by the seams of the skul; I answer, That hairs are ingendred by the adventitious heat of the brain, out of the excrementitious humors of the head, and fumes which ascend thither

ther; and therefore the brain ſtands in need of ventilation, becauſe of the many hot fumes and vapours continually aſcending thither.

X. The blood and ſpirits which are in the brain, alter not its natural temperament which is cold, eſpecially ſeeing the blood is ſent thither for nutrition; but nouriſhment is to chaniſh the part nouriſhed, being converted into its ſubſtance, and not to alter its temperament. Now the reaſon why we feel the moiſture of the brain, but not its frigidity, is, becauſe there is nothing to hinder the tact from diſcerning its moiſture, being in a ſoft ſubſtance (for where the ſubſtance is hard, there the tact is hindred from feeling the moiſture) though it be moiſt, as when we touch ice; but the tact is hindred from diſcerning the frigidity of the brain, becauſe of the veins and arteries within it, containing warm blood and ſpirits; yet though the brain be cold, the pith in the back-bone which is joyned to the brain, is hot, becauſe we finde no flegme about it, as about the brain; it is harder then the brain, therefore more apt to receive and to retain heat: it is begot of blood, which is hot; and it was fit that this warm pith ſhould be joyned to the cold brain, for moderating the brains frigidity.

XI. The brain was made cold to temper and moderate the heat of the heart; but not to diminiſh or deſtroy it; and for the ſame cauſe the heart was made hot to temper, but not to deſtroy the brains frigidity: therefore nature hath placed them at a proportionable diſtance: for had they been nearer, their actions upon each other had been more violent. 2. Though the organs of the ſenſe be in the brain, yet the original of ſenſation is not there, but in the heart: for the brain with its organs are helps and inſtruments, not the efficient cauſes of ſenſation. 3. The mutuall action of the heart and brain upon each other, is not done immediatly, but by the intercourſe of the ſpirits.

XII. Though nature doth not make two members ſpecifically different in the ſame body, for the ſame operation, therefore fiſhes want Lungs, becauſe they have gills for refrigeration; yet ſhe hath made both the brain and lungs too in our bodies, for the ſame end and work, namely, to refrigerate the heart; and yet in this ſhe is not ſuperfluous, becauſe the heart ſtood in need of a double refrigeration, as being ſubject to a double heat; the one is natural, for tempering of this the brain was made, that ſo the animal ſpirits might be generated;

the

the other is adventitious, caused by hot fumes: for clearing of these, and of cooling the heart, the lungs were made, and so were the arteries too. As for the two eyes, and two ears and other double organs in our bodies, they are not specifically different.

XIII. As the male hath a hotter heart then the female, so he hath a larger brain for the most part, that there may be the more refrigeration: I say for the most part, because the works of nature admit divers times exceptions; so Lions, though hotter then men, yet have lesser brains then men; but that heat in the Lion is more terrestriall, , and therefore needs lesser refrigeration then that which is more aerial; yet it may be supposed that man abounds more in heat then Lions, because he hath a strait body, which is caused by the abundance of hot bloud and spirits in mans body more then in other creatures.

XIV. That the testicles are not of such absolute necessity as the heart, even in respect of generation, is plain, because many creatures, as plants and insects have the faculty and power of generation without testicles. 2. The heart and brain in dignity far exceed the testicles, because these doe not communicate to all parts the power of generation, as the heart and brain doe impart life and sense. 3. Creatures that have lost the testicles, can live long without them, but no creature can live long without the heart and brain.

XV. In sensitive creatures that doth originally communicate the generative faculty, which imparts the sensitive, because this includes that; but it is the heart not the testicles, which imparts sensation, and consequently the heart not the testicles, causeth generation. If it be answered that the power of sensation is derived from the heart to the testicles, and consequently of generation; then we must know, that this very answer confirms the *Aristotelian* opinion, namely, that the heart not the testicles, is the original of the generative. 2. It is a weak argument to prove the principality of the testicles from their necessity, for every part of the body, though never so base, is necessary, and yet there is but one principal member: And as weak is it to argue the principality of the testicles from the change that is caused in the body upon the loss of them; for so there is upon the losse of any other member, and many times death it self. 3. The distinction of Sexes proceeds from the formative power, but this hath not its original residence in the testicles, but in the heart, as being the perfectest member

ber, and chief receptacle of heat and bloud, and ſpirits, by which the formative power operates.

XVI. The ſeed receives its ſpecifical form and eſſence in the heart, not in the teſticles, in which it receives indeed concoction, that it might be made fitter for generation: but concoction cauſeth only an alteration in the quality, not a mutation in the ſubſtance. So the fruit receiveth its maturity or ripeneſs immediatly from the bough on which it hangeth; but its generative power from the root alone: ſo that the teſticles are but the hearts inſtruments, working by its heat, and concocting the ſeed that it may be the fitter for generation.

XVII. The bodies of Eunuchs are fatter, weaker, and colder then of other men, not becauſe the teſticles do corroborate the body, as the *Galeniſts* think, but becauſe the ſeed wanting evacuation, is turned into fat, and many vapours or excrements, which with the ſeed are evacuated in other men, are retained in Eunuchs, which oppreſſe the natural heat, and conſequently cauſe debility; and becauſe of this coldneſſe, Eunuchs are leſſe hairy; for hairs are begot of hot fuliginous vapours.

Finis Libri Primi.

BOOK II.

GALEN in ſome things maintained; in ſome things rejected, or reconciled to ARISTOTLE.

CAP. I.

1. *Mans Body fitted onely for mans Soul.* Tritons *are not men.* 2. *How Mans body is more excellent then all others.* 3. *How the Soul is moſt in the Brain and Heart.* 4. *A twofold heat in us.* 5. *What Creatures nouriſh moſt.* 6. *The Womans imagination cannot alter the form.*

I. AS GOD hath beſtowed upon Man the moſt excellent Soul of all others; ſo hath he fitted him with a Body anſwerable to ſuch a Soul, of which no other Body is capable; and if it were, yet for want of fit Organs, the Soul could not exerciſe her functions; as we ſee in that Fiction of *Apuleius*, whoſe ſoul being in the body of an Aſſe, could neither ſpeak, nor write, nor doe any thing but what was proper to an Aſſe; yet I have read of *Tritons*, or Fiſhes having the face, lineaments, and ſhape of mans body; One was ſeen in the days of *Tiberius*, another in the time of *Auguſtus*, a third under *Nero*: *Pliny*, *Ælian*, *Theodor Gaza*, *Trapezuntius*, *Alexander ab Alexandro*, *Scaliger*, and divers others affirm the truth of this; yet theſe *Tritons* or *Nereides*, cannot be called, nor are they men, though they have the outward ſhape: for it is not the matter, nor outward lineaments, but the form that gives eſſence and denomination.

II. Mans body is of all others the moſt perfect and excellent; though he hath not wings like a bird to fly, nor can ſee ſo far as an Eagle, nor hear ſo quickly as a Fox, nor ſmell ſo well as a Dog, nor taſte ſo well as Poultry, nor hath ſo quick a taſt as Oyſters aud Spiders; yet his hands, ſpeech, and reaſon,

doe

doe countervail all these: for celerity and reception his senses yeild to the beasts; for variety and judgement they must yeild to him.

III. Though mans soul in respect of understanding and will, be inorganical, and therefore not properly resident in any particular member more then in another, yet accidentally, because the brain is the seat of the fantasie, from which the intellect receives its objects, and the heart the seat of the affections, subservient to the will; the brain is the seat of the intellect, the heart of the will.

IV. There is in us a twofold heat, the one celestial, the other elementary: that preserves us, this destroys us: that concocts our food, and turns it into nutriment, this corrupts and putrifies it, and turns it into noxious humours and excrements, as we see in burning Fevers. It is not then every heat that chylifieth or sanguifieth, or assimulateth, but this celestial heat: Neither is it the quantity, but the quality thereof, and affinity it hath with the things concocted: For there is more heat in a Lion, then in a Pigeon, and yet the Pigeon will concoct that which the Lion cannot; yet this celestial heat is helped by the elementary heat if it be temperate, and by the crasis, temperament, or constitution, if it be sound.

V. Nothing by way of food can cherish our natural heat, and maintain our life, but what had life and heat it self; and the more perfect life it had, the better it nourisheth, as having neerer affinity with us. Hence animals nourish more then vegitables, because the matter of their bodies and spirits, are more consonant to ours then of hearbs or fruits, which if they bee contrary to us in their nature and qualities, they destroy us, as poisonable hearbs do. Purging medicaments are of a middle nature, as having some similitude with the humours of our bodies, which they attract; as Agary with Flegme, Rubarb with Choler, &c. and some dissimilitude with our bodies, upon which they work by weakning them, especially if they have any delatory quality.

VI. Though the woman in conception, or afterwards, can by the strength of imagination impresse some note or mark upon the seed or Embryo: yet she cannot alter the sex or form as she pleaseth, because this is not the work of imagination, but of a diviner power, to wit, of the external formative agent; for which cause a man cannot beget any other then a man, for that his seed is not capable of any other form, neither doth the formative agent work otherwise then as the seed is inclinable to.

CAP. II.

1. *The Stomach and Lungs not neceſſary for life.* 2, *How the limbs are moved: the ſpirits are bodies more required for motion then ſenſation: the ſpirits are light: how they are the ſouls inſtruments: how the Muſcles move.* 3. *Seven properties of the brain.* 4. *Twelve properties of the eye.* 5. *Its ſubſtance watriſh.* 6. *Why but one ſight.* 7. *The eye how an agent and patient.* 8. *Its two lights and its colours. Light gives the ſecond act.*

THough the Stomach and Lights be two noble parts of the body for thoſe that are to live long; yet life can conſiſt without them or their action: For 1. Some have lived without chilification and reſpiration: the meſeraick veins can draw ſome portion of the clyſters to the liver for ſanguification, by which life can be preſerved. 2. Divers creatures live all the Winter, as Swallows, Cuckows, Dormiſe, &c. without any chilification or action of the ſtomach. 3. Women that are hyſterical, can live only by tranſpiration, without reſpiration at all. 4. The arteries can draw air to the heart, though there were no lungs at all, yet not with that conveniency, becauſe the lungs temper and qualifie the frigidity of the air before it comes to the heart. 5. Fiſhes breath not at all, nor have they any lungs, yet they live.

II. In the motion of our bodies the limbs are moved by the muſcles, theſe by the nerves, the nerves by the animal ſpirits, and theſe by the ſoul, which produceth neither ſenſe nor motion in the body without theſe ſpirits: for if the nerve be cut or obſtructed, or bound, motion ceaſeth; which ſheweth that the ſoul worketh by theſe ſpirits, and that in the nerve there is more then a bare faculty of ſenſe and motion required to make it move and feel: for in the obſtructed nerve there is the faculty ſtill, but not the motion, becauſe the ſpirits are intercepted, which have their original from the brain as well as the nerves, but their action from the ſoul. 2. Theſe ſpirits are bodies, as appears by their generation, fatigation & diſſipation: for when theſe ſpirits fail, motion ceaſeth, and we grow weary. 3. In the nerve though one and the ſame animal ſpirit cauſeth both ſenſe and motion; yet a greater vigour is required for motion then for ſenſation, becauſe the perfection of this conſiſts in reception only, but of that in action chiefly. Now more force is required for action then for paſſion. 4. In the animal ſpirits there is a light or ſplendour, becauſe they are a very attenuated

ſubſtance,

ſubſtance, warmed by a celeſtial heat: This light is perceived in the eye being ſhut, in the other ſenſes it is not ſeen, becauſe their organs are not tranſparent: Now the ſpirit of the eye is the ſame with that of the ear, &c. 5. The ſpirits are not properly the inſtruments of the ſoul, becauſe the ſoul is the form which worketh immediatly upon its matter; and the ſpirits are parts of this matter, but they are called inſtruments, becauſ they convey to the members the faculties of the ſoul. 6. Though the will moves the muſcles in men, and the will moves according to knowledge and election; yet in infants the muſcles are moved by a natural inſtinct, and ſo they are in beaſts who have not election and reaſon.

III. Man hath a larger and more capacious brain then other creatures have; becauſe the ſoul of man being endowed with more faculties, required a larger habitation. 2. The brain is void of ſenſe and feeling, becauſe it is the Judge of all the ſenſes. Thus the eye which ſeeth all colours, hath no colour it ſelf, nor the tongue and palat any taſte, which judgeth of all taſtes: experience ſheweth, that the wounded brain being cut or pricked, feeleth not. 3. Though the brain feeleth not, yet it hath a natural faculty to expel things hurtful; ſo there are antipathies and ſympathies in inſenſitive things. 4. The brain hath no animal motion, though it be the original of this motion; yet it hath a natural motion of *Syſtole* and *Diaſtole* for the generation of the ſpirits, and expulſion of noxious things. 5. The brain is cold and moiſt; cold naturally, but hot accidentally, by reaſon of the ſpirits and arteries in it: cold, otherwiſe the attenuated animal ſpirits in it would quickly waſt and conſume with heat; and with often ſtudy and cogitation, it would ſoon be inflamed, and ſo into phrenzies wee ſhould bee apt to fall. 6. Though the brain be cold, and the heart hot, yet the animal ſpirits are more attenuated then the vital, becauſe theſe are generated immediatly of the groſſe bloud, whereas the animal are begot of the vital ſpirits, and are refined by the arteries of the brain. 7. The brain is moiſt, 1. That it may the more eaſily receive impreſſions: 2. That it may the better reſiſt inflamation: And 3. That the nerves may by its moiſture bee the more pliable, which otherwiſe would be ſtiffe.

IV. The Eye is the moſt noble of all the ſenſes: 1. Becauſe its action is quickeſt, apprehending its object in an inſtant: 2. Though the object be never ſo far diſtant, it is perceived by the eye, as the ſtars are. 3. Becauſe light, which is the object of the eye, is of all accidents the moſt noble. 4. The eye hath

more objects then any other sense; for besides light and colour of all sorts, its particular objects, it hath also number, magnitude, state, motion and figure, which are common objects. 5. None of the senses hath such a curious fabrick: for the eye hath six tunicles, three humours, six muscles, two nerves, the optick and motory, many veins and arteries. 6. It is the first and chief organ of knowledge; for at first men got their knowledge by observation and the eye, though now we have it by instruction and the ear. 7. The eye hath the highest place of all the senses in the body. 8. And it hath the perfectest figure, for it is almost round, that it may move the easier and swifter. 9. It hath a liberty and command of it self which the other senses have not; for it can inclose it self within its casements, and open them when it pleaseth. 10. It hath a peculiar light within it self, besides that light which is in the air, and it hath more spirits then any other of the senses, and these spirits are more subtle, nimble, and quick then any other animal spirits are. 11. Without the eye no living creature could finde out its food, in which consisteth the life of the creature. 12. Without the eye men could not have naturally attained to the knowledge of God, and of Divinity; for by the contemplation of the Heavens, and their light and motions, men came to have the knowledge of their Maker: For the invisible things of him from the creation of the world, are clearly seen, being understood by the things that are made, *Rom.* 1.20.

V. The eye is of a watrish not of a fiery substance, as may bee seen, 1. By the water that flowes from it when it is hurt: 2. By the fat which is about it; this would consume if the eye were fiery: 3. By the watrish humour which is in the cavities of the face in the new formed Embryo: 4. By the reception and conservation of the species; for the fire can neither receive nor confer any image or species, as the water doth.

VI. Though there be two eyes, there is but one sight, or one object seen; 1. Because the optick nerves are united in one before they reach to the eyes: 2. Because there is but one fantasie, and one common sens which judgeth of the external object.

VII. The eye in respect of its grosse and solid parts, is a patient in seeing, by receiving the species or shape, (not the substance) into the chrystalline humor; but in respect of the spirits in the eye, it is an agent by perception of the species, and partly a patient: for there is some impression in the spirits, or else by them the species could not be conveyed into the common sense and phantasie: The spirits then are agents, not outwardly

wardly upon the object,but inwardly upon the ſpirits received from the object: and when they are employed about ſom other thing in the phantaſie, the eye ſeeth not its object, though the ſpecies be impreſſed in the chryſtalline; becauſe there is required for ſight, not only the impreſſion in the chryſtalline,but alſo a perception and apprehenſion in the ſpirits; in which action properly and formally viſion conſiſteth. And though the ſpirits be no part of the eye as it is a ſolid ſubſtance, yet they are part as the eye is the inſtrument of ſight.

VIII. There are in the eye when it ſeeth, two lights, the one from without, whereof there is greateſt quantity in the white of the eye; the other from within,which is moſt prevalent in the chryſtalline, diſpoſing it to receive the ſpecies, as the outward light diſpoſeth the air. The outward light, if it bee not proportionable to the inward, makes this unfit for viſion, not by extinguiſhing,or deſtroying it, for one light cannot deſtroy another; but by too much extending or deſtroying the mean and proportion of the inward light. There is beſides theſe two,a third light in the eies of owls,cats, & ſuch creatures as live by preying in the dark, which light is not immanent in the eye, but tranſient into the air, that the medium being illuminate,the ſpecies of the object might be raiſed.

IX. The eye hath not ſuch colours as are made by the mixture of the four elements, or prime qualities, but ſuch only as are made by the mixture of the light and the diaphanous or perſpicuous body. The firſt ſort of colours are in the dark in reſpect of their exiſtence or quality: the ſecond ſort hath no exiſtence at all in the dark: And though the light give not the firſt act or beeing to colours, yet it giveth the ſecond act in making them viſible,and actuating them, to work upon the eye, by ſending their ſpecies thither.

CAP. III.

1. *A twofold Heat in living things.* 2. *The Primitive Heat where, and how tempered.* 3. *Our ſpirits are not celeſtial, ſeveral Reaſons.* 4. *Our natural heat,what? it is no ſubſtance, in ſix Reaſons.* 5. *Many excellencies of mans body.* 6. *The Head, why the nobleſt part, and higheſt, as* Galen *thinks.*

THAT there is in living creatures beſides the elementary heat, another called celeſtial, is manifeſt, becauſe the fire or elementary heat,neither in part, nor in whole, is the cauſe

of generation. 2. Becauſe the elementary heat remains after the celeſtial is gone, as may be ſeen in ſpices, which retain or rather increaſe their elementary heat, as they grow drier, being ſeparate from the Tree; and yet they want that celeſtial heat by which they did live and had vegetation; for now being dead, nutrition, attraction, vegetation, growth, and other functions of life ceaſe, which were the effects of the celeſtial heat. 3. Becauſe in Mandrakes and other cold herbs, there is this celeſtial heat, by which they live; and yet no elementary heat at all; for they are cold both actually and vertually.

II. As in living creatures there be divers diſſimular parts, ſo there be temperaments, and diverſity of heat; all which are united in the heart, the fountain of heat, which it communicates to all parts by the bloud and ſpirits; this primitive heat is in perfect creatures compacted within the heart; in Trees and Plants, within the root; in Inſects it is diffus'd through all the body, without any union in one part more then another; which is the cauſe that when ſnakes and worms are cut in pieces, every piece moves, which is not ſo in the hand or foot of perfect animals if they be cut off; ſo wee ſee in ſome twigs of Trees, that being ſet in the ground, grow and take root; which ſhews, That the original heat and ſubſtance of the root, is in every part of the Tree; and that the primitive heat of the creature might bee brought to a temper, refrigeration is required, which in terreſtrial animals is performed by the air, in fiſhes by the water, in herbs by the earth moiſtned, by which they are nouriſhed and refreſhed.

III. The animal and vital ſpirits in our bodies are not a celeſtial ſubſtance, as ſome have thought. For 1. The Heavens are not ſubject to generation and corruption as theſe are. 2. The Heavens are a quinteſſence, but theſe are elementary or aerial. 3. The Heavens cannot be diminiſhed, which they muſt needs be if our ſpirits be heavenly bodies; for they are as they ſay, pieces of that great body, which at laſt will be quite ſpent, except they be repaired either by a new addition, or by the reuniting of the ſame ſpirits to it again. 4. Seeing the Heavens have but one motion which is circular; how can any part thereof come down into our bodies, except it hath alſo a ſtrait motion? 5. Gravity and levity are elementary qualities, whereof the Heaven is not capable, and therefore cannot deſcend. 6. Our ſpirits muſt either be united to the bodies of the Heavens, and ſo continuated bodies with them, or elſe ſeparated and divided, both which are abſurdities. 7. Theſe ſpirits did either move them-

ſelves downward, or elſe they had ſome other mover; the firſt we cannot grant, except wee make the celeſtial bodies, living creatures, for only ſuch move themſelves; neither can we grant the ſecond, except we know what this mover ſhould be; it cannot be natural, for the motion is violent; nor can the mover be violent, for the work of generation is natural; it remains then that theſe ſpirits are aerial in their nature and ſubſtance, but the inſtruments of the ſoul in regard of their function, in which regard only we conſider them as they are in our bodies; for many actions proceed from them, as they are the ſouls inſtruments, which cannot be effected by the air, as air.

IV. The natural or primogenial heat in living creatures, is not a ſubſtance made up of ſeed and menſtruous bloud, as *Galen* thought: For, 1. In Trees and Herbs there is this naturall heat, yet no menſtruous bloud; in inſects begot of putrified matter, there is this heat, but neither ſeed nor the foreſaid bloud. 2. This heat muſt diffuſe it ſelf through all the leaſt parts of the body, without which they cannot live; but if it be a body, there muſt be penetration of bodies; if there bee this diffuſion; if there be only an agglutination of this heat to the parts of the body, then theſe parts have not life in themſelves, and conſequently neither nutrition, or attraction which are the effects of life, and by which it is preſerved, and ſo the Fibres which are given for attraction are in theſe parts in vain. 3. If this body of our natural heat did live before it was articulated and diſtinguiſhed into membe s, then the heart is not the firſt thing that liveth; beſides it will follow, that the ſoul may be the act of an inorganical body, which is againſt the definition of the ſoul. 4. Nor can the bloud in the veins be this body, becauſe this bloud is the effect of concoction and nutrition, and it is bloud only: but that body of *Galens*. is the effect of generation, and the mixture of ſeed and bloud. 5. If this natural heat hath no life in it, then it will follow that the chief part of the living creature is without life. 6. This heat then is a quality, in children more vigorous and intenſe then in men, becauſe its work in theſe is only to concoct and nouriſh; but in thoſe to extend the body alſo, which is a greater work, and therefore requires more heat. Beſides, children cannot endure hunger ſo well as men, becauſe their heat being greater waſtes the bodie ſooner, where it hath not food to work upon: children then are more hot intenſively, but men extenſively, becauſe their bodies are larger, according to the dimenſion of which, their heat is diffuſed. And although they

they can eat harder and more ſolid meats then children, it argues not that their heat is greater then that of childrens, but that their inſtruments of maſtication (which is the firſt concoction) are better and ſtronger.

V. That mans body might be a fit habitation for the Soul, it was made of all bodies the moſt 1 temperate, and 2 proportionable, 3 the moſt copious of organs, ſo that it may well be called a Microcoſm, containing as in an epitome, the parts of the great world. 4. It was alſo made naked, as needing no other arms or defence, then what man was by his reaſon, tongue and hands, able to furniſh himſelf with. 5. It was made not of an heavenly, but of an elementary ſubſtance, becauſe man was made for knowledge, this is got by the ſenſes; theſe are grounded on the proportion of the 4 prime qualities, of which the Heavens are not capable. 7. It was made ſtrait that 1 man may be put in minde of his original that he came from heaven in reſpect of his ſoul! 2 That he might affect and ſeek after the things above, not here below. 3. He abounds more in ſpirits and heat then other creatures, and the heat and ſpirits raiſe the body upwards towards their own proper place. 4. If man had not been of a ſtrait body, his hands which were made for many excellent uſes, muſt have been hindred, and employed with the feet, for motion and ſupporting of his body. 6. Hee was made with long feet, that his body might be the more ſteddy and ſtrongly ſupported: with feet forward, becauſe all his actions and motions tend that way. 7. He was not made with wings to fly, becauſe he had hands to make him fly on the water in ſhips; and he had knowledg to make him fly to Heaven in contemplation; with the wings of Faith we can fly ſwifter & farther, then *David* could have don with the wings of a Dove.

VI. Mans head is of all parts in the body the nobleſt, therefore it is placed in the higheſt Region, and neareſt Heaven, which it reſembleth both in figure and uſe; it is almoſt round, 1. That it may be the more capacious of ſpirits and of brain, of which is more in man then in any other creature, becauſe in him is more variety, and perfection of animal ſpirits then in other creatures. 2. That it may bee the fitter for motion. 3. That it might be the ſtronger and more able to reſiſt injuries. Again for uſe: It is like Heaven, for this is the ſeat of the Angels or Intelligences, and that is the ſeat of the Intellect; ſo far forth, as it is the ſeat of the phantaſie by which the intellect worketh, and of the ſenſes by which the phantaſie is informed. And as all ſublunary bodies receive life, ſenſe,

ſenſe, or motion from the Heavens, ſo do all our members from the Head; ſo that if our brain be wounded, ſenſe and motion in the body preſently ceaſe. The head is that by which man is Lord over the beaſts, therefore deſerved to have the higheſt place in the body: it is the Citadel of this little world, in the ſafety of which conſiſteth the ſafety of the body; therefore hands, feet, arms, and all, are ready to protect the head when it is in danger. Hence anciently the head and brains were honored above the other members: they uſed to ſwear by the head, [*per caput hoc juro, per quod pater ante ſolebat.*] When any ſneezed, they were wont to bleſſe them with a prayer, becauſe the brain is affected in ſneezing. Men uſe to uncover their heads to their ſuperiours, intimating that they diſcover and preſent to their ſervice the nobleſt part of their bodies; and for honours ſake the Prieſt abſtained from eating of the brains.

CAP. IV.

1. *What the ſpirits are.* 2. *They differ in ſeven things.* 3. *The Woman is only paſſive in generation: Her Teſticles, Arteries, &c. not ſpermatical parts; the males ſeed evaporates, why the child reſembles the parents; the bloud may be called ſeed.* 4. *Adeps how generated. Of the Lungs, they are hot.*

THE Animal and Vital Spirits are ſo called, not only becauſe we have ſenſe and life by them, but alſo becauſe they firſt have life and animation in themſelves; for otherwiſe how could the ſoul give life and ſenſe to the body by theſe which are not (as ſome think) capable of either. 2. Theſe ſpirits are parts of our bodies, parts, I ſay, not ſolid and containing, but fluxil and contained. 3. They are one with the veſſels & members, to which they do adhere; one, not ſpecifically, but quantitatively; ſo the griſle is one with the bone that ends in the griſle. 4. Theſe ſpirits are not the ſame with the vapours that are in our bodies: For the vapours are excrements, and hurtful to us, therefore nature ſtrives to expel them; but the ſpirits are parts, & helpful to us, therfore nature labors to retain them. 5. Theſe ſpirits ſomtimes are extinguiſhed by violence, ſomtimes are waſted for defect of food and maintenance; he that is drowned hath his ſpirits extinguiſhed, he that dieth of ſickneſſe, hath his ſpirits waſted. Thus the flame in the candle by the wind is extinguiſhed, by the defect of wax it is waſted: the quantity remains in that, it is loſt in this.

II. The Animal, Vital, and Natural ſpirits are diſtinct in their originals;

originals; for the animals are from the brain, the vital from the heart, the natural from the liver. 2. In their Veſſels; for the animal are in the nerves, the vital in the arteries, the natural in the veins. 3. In their operations; from the animal we have ſenſe and motion; from the vital, life; from the natural auction and nutrition. 4. The vital ſpirits remain when the animal and natural are gone. In a Palſie there is neither ſenſe nor motion; in an Atrophy there is neither auction nor nutritition; and conſequently, neither animal, nor natural ſpirits, and yet there is life and vital ſpirits. 5. The Natural ſpirits are in every part of the body, ſo are not the Animal and Vital, but in their proper veſſels. 6. The motion of the Animal ſpirits is voluntary, and in our power, ſo is not the motion of the other ſpirits. 7. The Animal ſpirits reſt in ſleep, the Vital and Natural are then moſt active. 8. The Animal ſpirits are ſubject to fatigation and ceſſation, the others not. 9. In Vegitables there are Natural and Vital ſpirits, but not Animal; in imperfect Animals there are all three, but groſſer and colder, therefore not ſo apt to be diſſipated.

III. That there is no active ſeed in the female for generation, but that ſhe is meerly paſſive, in furniſhing only the Matter or Menſtruous bloud with the place of conception, is according to *Ariſtotle* manifeſt; becauſe if the females ſeed were active, ſhe may conceive of her ſelf without the help of the male, ſeeing ſhe hath an active and a paſſive principle, to wit, ſeed and bloud; and where theſe principles are, there will be action and paſſion. If the *Galeniſts* object, that the females ſeed is colder then the males, and therefore not procreative without it; I anſwer, That though it be colder then the males, yet it is hotter then the bloud, and therefore active, the bloud being meerly paſſive. Again, the heat of the males ſeed is but an accident, no ways concurring eſſentially to generation, but only by way of fomenting and cheriſhing the females ſeed, as the heat of the Hen doth to the generation or production of the Partridg; wheras the whole power and faculty of generation, was in the Egg, not in the Hen: & ſo by this opinion, the males ſeed affords nothing but heat or fomentation. 2. If the females ſeed bee active, and the males too, it will follow, that two efficients numerically different, and having no ſubordination to each other, do produce one effect, which is abſurd. 3. It will follow, that there are three material cauſes, to wit, the males ſeed, the females, and the bloud, and therefore muſt be three forms; for one form hath but one matter. 4. It will follow, that the female

is

is perfecter then the male, as having more principles of generation, to wit, the ſeed, the bloud, and the place or matrix. 5. And in this reſpect, that the male will ſtand more in need of the female, then ſhe of him, he being more indigent of theſe principles of generation then ſhe, and having a greater deſire to perpetrate the ſpecies then ſhe. 6. The *Galeniſts* are miſtaken, in thinking thoſe glandulous ſubſtances in the female to bee teſticles containing ſeed, whereas they are kernels to receive the ſuperfluous moiſture of the matrix. 7. The arteries, nerves, and veins, are not ſpermatical parts; for of the ſeed no parts are procreated, but they are ſanguineal, as the fleſh differing from the fleſh in this, that being cut, they do not unite again, as the fleſh, becauſe of their hardneſſe and drineſſe, and want of that moiſture which is in the fleſh. 8. The males ſeed being received into the menſtruous bloud, doth evaporate and turn into ſpirits, animating the informed maſſe. 9. The child ſometimes reſembleth the Father, ſometimes the Mother, according to the predominancy of the ſeed or the bloud. 10. As the bloud nouriſheth the nerves, veins, &c. ſo it may be transformed into them. 11. The bloud may be called ſeed, becauſe the ſeed is begot of it; and as in Vegitables, Hearbs and Trees are begot of ſeed, ſo in animals, procreation is of the bloud. Hence Chriſt is called the Seed of the Woman.

IV. The *Adeps* or fat in our bodies is generated, not by heat, for heat diſſolves and melts it. 2. Coldeſt temperaments are fatteſt, as Women are fatter commonly then men, in Winter, creatures are fatter then in Summer, in cold more then in hot Climats men are fatter; *Engliſh* and *Dutch* are fatter then *Italians* or *Spaniards*. 3. Fat adheres only to the colder parts, as the membranes: Nor is it generated by cold; For, 1. No part of our body is actually cold, but hot. 2. The Kidneys and heart, which are very hot, have fat adhering to them. 3. Melancholy men, and old men, who are cold, have little or no fat. It remains then, that the *Adeps* is begot of a temperate heat, which in reſpect of a greater heat may be called cold; as the brain in reſpect of the heart. And nature hath placed the fat next to the cold membranous parts, for cheriſhing of them; ſo the fat of the Cawle was chiefly ordained for fomenting of the ſtomach, which is oftentimes waſted by the exceſſive heat of the liver. Hence it is, that a hot liver is accompanied with a cold ſtomach: for the hot liver like a cupping glaſſe, ſucks and draws the heat of the neighbouring parts to it.

V. When

V. When we consider the cold flegm with which the lungs are still infested. 2. The office of them, which is to refrigerate the heart. 3. Their colour, which is whitish; we would think that they were of a cold constitution. On the other side, when we 1. look upon their light and spongy substance; 2. on their office, which is to temper and warm the cold air, that it may not offend the heart: 3. On their nutriment, which is the cholerick or bilious bloud, we would think they were hot of constitution; and indeed so they are, and cold only by accident, by reason of the external air, and water from the brain, and other parts.

CAP. V.

1. *The prerogative of the heart.* 2. *The actions of our members.* 3. *There are no spermatical parts.* 4. *The bones, nerves, veins, &c. why not easily reunited.* 5. *The spermatical parts hotter then the sanguincal.* 6. *The brains and scull, bones and teeth compared.*

THE Heart hath divers prerogatives above other members: 1. It is the Fountain of our natural heat. 2. Of the Vital spirits, from whence the Animal have their Original. 3. It is placed in the midst of the breast. 4. It is the first that lives, and the last that dies. 5. It is of that absolute necessity, that the welfare of the sensitive creature depends on it; therefore Nature preserves it longest from diseases, and as soon as the heart is ill-affected, the body droopeth. 6. Sensitive creatures can live, some without Lungs, some without a Spleen, some without Kidneys, some without a Gall, some without a Bladder, but none can live without the Heart, or something answering to the Heart, as bloudless animals. 7. The Heart is admirable in its motions, if either we consider the manner or perpetuity thereof, or that it is of it self not depending upon our will or pleasure.

II. The actions of our members, depend originally from the temperament of the simular parts; but in respect of perfection and consummation, from the conformity and right situation of the Organ, so the temperament of the Chrystalline humor is the efficient cause of sight; but the situation and conformity of the parts of the eye, is the perfecting or consummating cause: For if the Chrystalline, or other parts of the eye, were

were otherwiſe ſituated, we ſhould either not ſee ſo well, or not at all.

III. That there are no ſpermatical parts, as Nerves, Bones, Veins, &c. but ſanguineal only, is plain by theſe reaſons, 1. To make more material cauſes then one, is to multiply entities needleſly, whereas the menſtruous bloud is ſufficient matter for all the parts; which becauſe it is the matter of our bodies, it had an inclination, diſpoſition, or potentiality to all parts: and becauſe the work to be produced, was Heterogenious, and the form heterogenious, therefore the matter had an heterogenious potentiality, as well to thoſe parts which the Phyſitians call ſpermatical, as to the ſanguineal. 2. I would know which be the ſpermatical parts of an Egge: not the white; for of that they grant the whole Chick is formed: not the yelk; for that is, they ſay, the food of the Chick, and yet we ſee the Chick hath bones, and other ſpermatical parts, as they call them. If then Bones and Nerves are no ſeminall parts in a Chick, neither are they in a Childe, the reaſon being alike in both. 3. The ſpermatical parts are nouriſhed by the blood, then doubtleſs they were generated of blood: for [*iiſdem nutrimur ex quibus conſtamus*] and there can be no nouriſhment without tranſition and tranſmutation of the blood into the parts nouriſhed. Now to ſay, that the blood which nouriſheth theſe parts, becomes ſeed, or ſpermatical, is to employ the teſticles in continual working of ſeed for nutrition of the ſpermatical parts: how can ſo much ſeed be generated, and by what veſſels ſhall they be carried to the upper parts of the body. 4. The heart and liver are ſanguineal parts: then doubtleſs the nerves, arteries, and veins which are from them, bee ſanguineal.

IV. The Bones, Nerves, Arteries, Veins and Griſſles being cut or broke, are not ſo eaſily re-united as the fleſhy parts: not becauſe they are ſpermatical, but becauſe they are harder and drier then the fleſhy: for in children, while they are ſoft and moiſt, they are eaſily reunited; and the Veins which are ſofter then the Arteries, are ſooner healed: for the hardneſs, thickneſs, and perpetual motion of the Arteries, hinder its coalition. 2. Likewiſe where there is defect of natural heat, as in old men, theſe are hardly knit together: For heat is the chief Artificer or Agent in the body. 3. And where there is defect of matter, or radicall moiſture, the cure is difficult, as in old men. 4. If there be not a ſufficient time given, the cure will never be effected: Thus the heart being wounded,

ded, is never united, becauſe life flieth before the cure can be performed.

V. The ſpermatical parts by moſt are counted colder then the ſanguineal; which cannot be: for we find by experience, that there is more heat in the ſtomach, then in the liver; for it is a greater heat that turns bones, or ſuch hard meats into a liquid ſubſtance, then this which turns our liquid ſubſtance into another: to wit, the Chylus into blood: If it be objected, that thoſe creatures, whoſe ſtomachs are incompaſſed with fleſh concoct beſt: I anſwer, it is true, not becauſe the fleſh is hotter then the ſtomach, but becauſe it keeps in the heat: thus though our cloaths keep in our heat, no man will ſay, that they are hotter then we; for this cauſe our bones and nerves are wrapped about with fleſh, and yet theſe are hotter then the fleſh, in their opinion that call them ſpermatical; for they confeſs, that the ſeed is hotter then the bloud, therefore that which is generated of ſeed muſt needs be hotter, then that which is begot of blood. If it be objected, that the ſeed is hot in reſpect of its ſpirits, but cold in reſpect of its matter: I anſwer, that if the matter of the ſeed were not hot, it could not ſo much abound in ſpirits, for by the heat the ſpirits are begot, and not heat by the ſpirits: therefore when the heat fails, the ſpirits fail: Hence it is, that the animal ſpirits in the nerves move not the hand, when it is benummed with cold: but let the hand be warmed, and then the ſpirits have life again. 2. Thoſe parts which they call ſpermatical, are more ſenſible of the cold, and ſooner offended by it then the ſanguineal parts, and therefore muſt needs be hotter: for one contrary is moſt ſenſible of another: thus are we more ſenſible of a little cold in Summer, when we are hot, then of a great deal in Winter; Southern people, whoſe bloods are hot, are ſooner offended with cold, then the Northern, whoſe conſtitution is colder. 3. The heat of the bladder, which they call a ſpermatical part, is ſo great, that it can bake the ſlimy ſubſtance of the urine into a hard ſtone, which argues its heat above the ſanguineal parts. Some Phyſitians anſwer, that this is done, not becauſe of the heat, but by reaſon of the long ſtay, and ſliminеſs of the matter: but they muſt know, that the ſlimy matter is meerly paſſive, and that it is the heat which is the agent, and artificer of the ſtone: as for the long ſtay, that is but a help, for time is no agent. 4. That the bones are hot, is manifeſt, for they have much fat in them, as we ſee in bones when they are burned, and a greater heat was required to bring

them

them to that hardneſs, then the ordinary heat of the ſanguineal parts.

VI. The brain was not made for the skul, but the skul for the brain, therefore it is like they were formed both together, and that the skul was proportioned to the bigneſs of the brain, and not this to the bigneſs of the skull. 2. The brain and skull were placed uppermoſt, for the eyes, which were to be neer the brain, becauſe of the ſpirits: and optick nerves, which by reaſon of their ſoftneſs, were fitteſt to be implanted in the eye, otherwiſe they had been too hard; for the nerve is harder, as it is farther from the brain: and no place was ſo fit for the eyes, which were to watch over the body, as the upper place; neither could the eyes be ſo ſecure any where, as within theſe concavities of the skull. 3. The skull being a bone, feeleth not, for bones have no other ſenſe, but what is in the membrans or *Perioſtium*; neither can there be ſenſe, but where there be nerves, but there be none in the bones: except in the teeth, which therefore feel, becauſe the nerves are incorporated in them, and communicate the ſenſitive ſpirits to all parts of them, and the ſenſitive faculty with them: yet they are more ſenſible of the firſt, then of the ſecond qualities. 4. The teeth are ſtill growing, becauſe there is continual need of them, and are harder then other bones, becauſe they were made to bruiſe hard meats. 5. They are more ſenſible and ſooner offended with cold then with heat; and yet heat is the more active quality, which ſheweth, that the conſtitution of the teeth is hot, for if they were cold, they ſhould not bee ſo ſoon troubled with cold, being a friendly quality.

CAP. VI.

1. *Two ſorts of bloud; the heart firſt liveth, and is nouriſhed, and the original of bloud, not the liver.* 2. *The hearts action on* Vena cava; *the cauſe of ſanguification.* 3. *Bloud cauſed by the heart.* 4. *How every part draws.* 5. *Heart the firſt principle of the nerves.* 6. *Nerves, how inſtruments of ſenſe and motion.* 7. *The ſame nerves ſerve for ſenſe and motion.*

1. THERE are in our bodies two ſorts of blood, the one arterial, begot in the heart, for the exciting of our heat; the other venal, begot in the liver, for nouriſhing of the body: ſo according to *Ariſtotle*, the heart; and according to *Galen*,

the liver may be called the fountain of bloud. 2. As the heart is the firſt thing that liveth in us, ſo it muſt needs be firſt nouriſhed, for life cannot be without nutriment, & nutriment cannot be without blood, therefore there muſt needs be blood in the heart before there was any in the liver. 3. As the heart firſt liveth, ſo it firſt operates, for life conſiſts in operation: but the proper work of the heart is to beget arterial blood and vital ſpirits, therefore the blood was firſt in the heart. 4. Though blood reſemble the liver in colour, it will not therefore follow that blood hath its firſt original from the liver, but only that it is the receptacle and cyſtern of blood; ſo the bag, in which the gall lieth, hath the ſame colour with the gall, and yet this is generated in the liver, and onely contained in the bag; and its a queſtion, whether the liver coloureth the blood, or the blood the liver. 5. In fear and ſadneſs, the blood retires into the heart, which is by means of the ſpirits recoiling thither with the blood, as to their original. 6. In the brain we finde four ſenſible concavities for the animall ſpirits; in the heart two, for the blood and vital ſpirits; but in the liver none, for the blood; in the teſticles none, for the ſeed; nor in the breaſt for the milk; which makes me doubt, whether the blood, ſeed, and milk, have any concoction in theſe parts, if they have, it muſt be ſurely in a very ſmall quantity. 7. I finde pure blood no where but in the heart and veins; by which I gather that there muſt be a greater commerce between the heart and veins, then ſome doe conceive, which appears alſo by the implantation of the *vena cava* in the heart, which cannot be ſeparated without tearing of the heart or vein; and that either the blood is perfected in the heart, and prepared in the liver, or elſe prepared in the heart, and perfected in the liver: beſides, that the arteries doe all along accompany the veins.

II. I ſee no reaſon why we may not affirm, that the heart is continually in its *Diaſtole*, drawing blood out of the *vena cava*; and in its *Syſtole* or contraction, refunding blood into the ſame vein: for this continual motion of the blood, is no more impoſſible then the continual motion of the heart and arteries; neither is it more abſurd for perfect and imperfect blood to bee mingled in this motion, then for cholerick, melancholick and flegmatick blood, to be mingled with pure blood in the veins. 2. When the liver is vitiated, ſanguification faileth, and ſo hydropſies follow, which doth not prove that the liver is the ſole cauſe of ſanguification, but that it is ſubordinate to the heart: ſo when the Chryſtalline humour is vitiated, the ſight

faileth,

faileth, and yet this humour is not the ſole cauſe of ſight, but is ſubordinate to the optick nerve and ſpirits. The heart then by the liver diſtributes blood to the members. 3. The veins have their radication in the liver, their office and diſtribution from the liver and the heart: their original from neither, in reſpect of matter, but in reſpect of efficiency from the heart; for this firſt liveth, and therefore the fitteſt place for the formative faculty to reſide in.

III. The *Chylus* is turned into blood, not by the ſubſtance of the Liver, for the *Chylus* comes not neer it, and there can be no alteration or concoction without contact: nor by the veins, for their office is to convey and diſtribute the bloud, not to make it. So the arteries doe not make the arterial blood, which they convey: beſides that the form, temperament, and colour of the blood is far different from that of the veins; therfore the blood is made by the power of that celeſtial heat by which we receive life, growth, and nutriment: for the ſame heat produceth divers effects in the divers ſubjects it works upon; in the ſtomach it turns our meat into a white *Chylus*; in the veins into red blood: in the ſeminal veſſels into ſeed, in the breaſts into milk, &c.

IV. The ſame Meſeraick veins which draw the pureſt part of the *Chylus* from the inteſtins, that it might there receive ſanguification, contain alſo pure blood, which the inteſtines draw for their nutriment, for every part draws that food which it moſt delights in. Thus from the ſame maſs of blood, the Spleen draws melancholy, the gall choler, the kidneys, water.

V. The *Peripateticks* will have the heart to be the firſt original of the nerves, and of the ſenſitive motion: The *Galeniſts* will have the brain; but this contention is needleſs: For the heart is the firſt principle, becauſe it is the firſt that lives and moves, whereas the brain moves not but by the heart. In a Syncope, or ſwowning fit of the heart, all ſenſe and motion ſuddenly fail, which could not be if theſe had not their original from the heart: the brain may be called the ſecondary or ſubordinate cauſ or principle: for this by its cold, tempers the vital ſpirits, and ſo they become ſenſitive or animal. Hence it is that in an Apoplexy there is a ſudden failing of ſenſe and motion. If any ſay, that the body can move after the heart is taken out, and that therefore the heart cannot be the firſt principle of motion: I anſwer, ſo can the body move after the head is off, as wee ſee in Poultry. This motion then excludes neither the head nor heart from being originals: for

it is cauſed by the remainder of the ſpirits, which are left in the nerves and arteries. As for the Apoplexy, I take it to bee an affection, not of the brains alone, but of the nerves alſo.

VI. The common opinion is, that the nerves are the inſtruments of ſenſe and motion: and yet we ſee ſenſe and motion where there are no nerves: for in every part of the body there are not nerves, and yet every part feels and moves: this ſenſe and motion muſt needs proceed from the ſpirits in the blood, which is in every part of the fleſh and skin, where there are no veins. If it be replyed, that upon the obſtruction, or binding of the nerve, ſenſe and motion fail: I anſwer, the like failing there is of ſenſe and motion, when the arteries called *Carotides*, are bound up; for as the animal ſpirits will not work without the vital, neither will the ſpirits in the blood and fleſh work, if they fail which are in the nerves, ſuch is the union amongſt them, that this failing, all action ceaſeth.

VII. Seeing the ſenſitive and motive Spirits differ not ſpecifically, there is no need why wee ſhould aſſign different nerves to ſenſe and motion; for the ſame neve ſerves to both; it is true, that there be ſome hard, ſome ſoft nerves, becauſe ſome have their original from the ſoft brain, and ſome from the harder pith of the baek bone; and that the ſoft nerve is fitteſt for ſenſe, which conſiſteth in reception, for ſoft things are apteſt to receive impreſſions; as the hard nerve is fitteſt for motion which conſiſteth in action; therefore the ſame nerve conveyeth ſenſe to all parts capable of ſenſe, and motion to the parts apt to be moved: Hence the nerves inſerted in the muſcles, move them; but the nerves inſerted into the mouth of the ſtomach, moves it not, becauſe the ſtomach hath no muſcles, yet it communicates to it, an exquiſite ſenſe.

CHAP.

CHAP. VII.

1. *How the ſpirits paſs through the nerves: their ſwift and various motions, even in ſleep: motion and ſenſe not ſtill together.* 2. *Senſe and motion in phrenſies, epilepſies, leproſies, caros.* 3. *Muſcles, how, when and where the cauſes of voluntary motion.* 4. *How the fibres and tendons move the muſcles.* 5. *The muſcles of the tongue, abdomen, diaphragma, ribs, bladder.* 6. *The organs of tact, its medium.*

I. ALTHOUGH the nerves are not ſenſibly pervious as the Veines and Arteries are, which were purpoſely made hollow for the paſſage of the venal and arterial blood; yet the animall ſpirits being ſubtil and ſublimated bodies can freely paſſe through the ſoft and ſpungy ſubſtance thereof, as wel as ſweat through the pores of the skin. 2. Though in the Palſie the animal ſpirits cannot paſſe through the thick, clammy and glaſſy flegme, which by reſon of its coldneſſe, deads the ſpirits, which without the natural heat, have no vigour or motion, yet they can freely paſſe through the nerves by help of the native heat. 3. Though the ſpirits by reaſon of their ſpecifical form or aerial nature ſhould only move upward, yet as they are inſtruments of the ſoul, they move which way the ſoul will have them move. 4. Though no groſſe body can move in an inſtant, yet their ſpirits can, being moved by the ſoul immediatly, and being ſuch ſublimate and ſubtil bodies, that they come neer to the nature of ſpirits. 5. Though in ſleep the ſenſes are tied up, yet there is oftentimes motion; as we ſee in thoſe that walk and talk in their ſleep, and yet feel not; becauſe the fore ventricles of the brain are affected, in which is the common ſenſe, ſo is not the pith in the back, from which the moſt of the motory nerves have their original. 6. In one and the ſame nerve oft times motion faileth, and the ſenſe remaineth, becauſe more ſpirits are required, and greater force for motion being an action, then for ſenſe, which conſiſteth in reception or paſſion. 7. Senſe doth ſometimes fail, the motion remaining ſound; when the nervous branches which are inſerted into the skin, are hurt or ill-affected, at the ſame time the nerves inſerted into the muſcles may be ſound.

II. In phrenſies the motion is ſtrong, but the ſenſe weak; becauſe the braines being inflamed, the nerves are heated

and dried, therefore fitter for motion, but the leſſe apt for ſenſe, which requireth a ſoft nerve. 2. In the falling ſickneſs ſenſe faileth, but not motion, becauſe the fore ventricles of the brain being ill-affected, the common ſenſe is intercepted; but the pith of the back bone from whence the moſt nerves are derived, is not hurt, therefore motion not hindred. 3. In leproſies the ſenſe is dulled, but not the motion, becauſe the nerves and skin are dried, by which ſenſe is hindred, but not motion. 4. In a deep ſleep or Caros, there is reſpiration without ſenſe, becauſe the fore-part of the brain is hurt, but not the nerves and muſcles of the breaſt. 5. Oftentimes the eye loſeth its ſight, but not its motion, becauſe the optick nerve by which we ſee, is not the ſame with the nerves, by which the eye is moved.

III. All ſpontaneous motions are cauſed by the ſpirits in the brains, nerves and muſcles in the creatures that have them, but where theſe organs are not, the animal ſpirits move the body without them, as we ſee in worms. 2. All muſcles are not the organs of voluntary motion: for the three little muſcles within the ears move them not to hear when we pleaſe, for many times wee hear what wee would not. 3. In thoſe parts where there be nerves without muſcles, there is no voluntary motion, becauſe the nerves convey only the ſpirits, which the muſcles receive, and by them immediately move the body. 4. Reſpiration in ſleep is a natural, not a voluntary motion, cauſed notwithſtanding by the muſcles of the breaſt. 5. Sleep-walkers are moved by the muſcles, which motion then cannot be voluntary, for the walker hath not knowledge of his walking, or of the end thereof. 6. Beaſts are moved by their muſcles, which motion in them cannot be called voluntary, but ſpontaneous onely.

IV. All muſcles have not tendones, but ſuch as are appointed for a ſtrong and continual motion: hence the muſcles of the tongue, bladder, and *anus*, have no tendones. 2. The muſcle is moved not onely by the nerves and tendones, but alſo by the fibres within its own fleſhy ſubſtance: and indeed the fibrous fleſh is the chief inſtrument of ſpontaneous motion; and where they are wanting, there is no ſuch motion: Hence it is that beaſts can move their skins, which men cannot, becauſe beaſts skins adhere cloſe to a fibrous ſubſtance, whereas that of mans is nervous; onely the skin of the face in us is movable, becauſe muſculous and fibrous.

V. Though the ſubſtance of the tongue be not a muſculous

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or fibrous fleſh, yet it receiveth its divers motions from divers muſcles. 2. The muſcles of the abdomen are chiefly made for preſſing of the ſame, when nature deſires to expel the excrements, and in the next place to move the breaſt with the other muſcles appointed for reſpiration. 3. The muſcle of the bladder called Sphincter, was made partly for opening a paſſage for the urine to paſſe away, which it doth by dilating and extending it ſelf; and partly for ſhutting up of the bladder by contracting it ſelf, leſt the urine ſhould paſſe from us in ſleep, or againſt our wills whileſt we are awaked. 4. The muſcle called diaphragma, or the midriff, was made for exſpiration and inſpiration; in inſpiration, it dilateth it ſelf, but in expiration, it is contracted upward, as we ſee in dead bodies. 6. The muſcles of the ribs called Intercoſtals, are ſome of them external, which diſtend the breaſt for inſpiration, ſome internal, which contract the breaſt for exſpiration.

VI. *Ariſtotelians* will have the fleſh, *Galeniſts* the skin to be the organ of tact: but I think both are; for I take the skin to be nothing elſe but the outward ſuperficies of the fleſh, a little dried and hardned; and differing no other way from the fleſh, then the outward skin of the apple, from the ſofter ſubſtance thereof; ſo then the fleſh, both as it is a ſoft ſubſtance, and as it is hardned in its outward ſuperficies, is the organ of tact, by means of the nerves and fibres diffuſed into it; and whereas viſion, hearing, and ſmelling, have the air for their medium, tact and taſte, which are the two abſolutely needfull ſenſes, without which we cannot live, (whereas without the other three we may) have no medium at all.

CHAP. VIII.

1. *Bloud, milk, &c. No integral parts.* 2. *How the parts draw their aliment.* 3. *And expel things hurtful.* 4. *Of the inteſtines and fæces.* 5. *The inteſtines retentive faculty.* 6. *Of the ſtomach and its appetite or ſenſe.* 7. *Whether the ſtomach is nouriſhed by Chylus or bloud.*

1 BLOOD, Milk, Fat, Marrow, are not properly integral parts of our bodies, for the body is perfect in its limbs and members, without theſe; and theſe in time of hunger, nouriſh the body, whereas one part cannot be the aliment of another; beſides every part hath its figure and ſhape,

but theſe have none; yet in a large ſenſe they may bee called parts, as they help to make up the whole.

II. As the Loadſtone draweth Iron, and Plants nutriment from the earth, ſo doth every part of our bodies draw that aliment which is moſt proper for it: ſome by the help of the fibres, as the heart in its *Diaſtole* draws blood from *Vena cava* into its right ventricle by the help of the fibres: ſome without their help, as bones, griſles, and ligaments. So the Inteſtines draw without fibers, the Chylus from the Ventricle, with which they are delighted; and they draw blood from the Meſeraick veins, with which they are nouriſhed; and the ſame veines draw the purer part of the Chylus from the Inteſtines for ſanguification.

III. The ſame part that draws things needful, expels the ſame things when they grow ſuperfluous or hurtful: thus the ventricles expel the Chylus into the Inteſtines, and theſe expel their groſſer and excrementitious parts out of the body: ſo the heart expels by its tranſverſe fibers, blood, and ſpirits, and hurtful vapours too. And indeed nature is more ſolicitous in expelling of things hurtful, then in attracting of things needful. Thus we ſee in dying people, that expiration is ſtronger then inſpiration, nature being more willing to be rid of hurtful vapours, then to receive freſh aire: ſo when the inteſtines are affected with inflammations, obſtructions, or ulcerations, that they cannot ſend the excrement downward, they force it upward into the ſtomach again, and ſo expel it by the mouth, as in the *Iliaca paſſio.*

IV. The expulſion of the Fœces is partly the natural or periſtaltick motion of the inteſtines, and partly the voluntary motion of the muſcles of the *Abdomen*; which muſcles being contracted, preſſe the inteſtine. 2. There are ſtraight Fibers in the inteſtine, called *Rectum*, not ſo much for attraction, as for ſtrengthning the circular Fibers. 3. The Colon is ſeated uppermoſt neer to the bottome of the ſtomach, and hollowneſſe of the liver, that by the touch of theſe parts, the remainders of the meat which are in the cels of the Colon, might be better concocted. 4. The ſtink of the fœces proceed partly from the ſuperfluous humidity, which is the mother of putrefaction; and partly from the heat of the inteſtin, which though it be natural to the aliment which it concocts, yet it is external to the excrement which it expels. 5. The length of the inteſtins, which are ſeven times as long as the body, and the many windings or folds of them, beſides the *Valvula*

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or ſhutter in the end of tho *Cæcum*, do ſhew that the injections by the fundament can aſcend no higher then the blind inteſtine, except there be any of thoſe three diſtempers in the guts, which I mentioned but now, or elſe the ſtomach be diſtempered by *Bulimia*; for in ſuch a caſe it will draw the fœces to it. 6. Clyſters are ſometimes carried to the liver by means of the meſeraick veins, which ſuck ſome part of it from the inteſtins.

V. The ſubſtance, temper, and colour of the inteſtines and ventricles, is the ſame; therefore the Chylus is not only concocted in the ventricle, but in the inteſtins alſo; and as the one of theſe members is affected, ſo is the other. 2. As in the inteſtines there is an attractive, concoctive, and expulſive faculty, ſo there is alſo a retentive; for all theſe affections are in the ventricle which is of the ſame ſubſtance with the inteſtines. To what end are ſtiptick or reſtringent medicaments, uſed in Fluxes, but to corroborate the retentive faculty of the inteſtins; in the lientery the meat paſſeth away without concoction, becauſe the retentive faculty both of the ventricle and inteſtins is hurt.

VI. The mouth of the ſtomach being united to the Diaphragma, and this to the breaſt-bone, is the cauſe that we find much pain about this bone, when the mouth of the ſtomach is ill-affected. 2. In the mouth of the ſtomach is the ſeat of appetite, by reaſon of the two ſtomachical nerves there, which when they are refrigerated or obſtructed, the appetite is diſſolved: as in *Bulimia*, where there is a continual attraction from the ſtomach, but no ſenſe or appetite; but when the ſtomach is moleſted with cold and ſowre humours, there is a continuall ſenſe or appetite, though there be no inanition of the part, as in the diſeaſe called the Dogs appetite. 3. By reaſon of the ſympathy that is between the mouth of the ſtomach, and the heart, they had of old the ſame name, and they have the ſame ſymptomes. 4. The appetite being an animal faculty, hath its ſeat in the braine originally, in the ſtomach ſubjectively; the faculty is in both, but the action onely in the ſtomach.

VII. Though the ſtomach be delighted and ſatisfied with the meat it receiveth; yet it is not thereby immediately and properly nouriſhed, but by the blood; therefore nature hath furniſhed it with divers veins: neither can the Chylus be fit nutriment, till it be turned into blood, & the cholerick, melancholy & watriſh excrements be ſeparated from it. Beſides, how can the

ſtomach

ſtomach be nouriſhed with *Chylus*, when the body is red only by Clyſters, which the liver ſanguifies: or how are thoſe creatures fed with *Chylus*, which eat not, but ſleep all the Winter. The animal or ſenſitive hunger therefore of the ventricle, is ſatisfied upon the receiving of meat; but its natural hunger is not ſatisfied till the blood be converted into its ſubſtance.

CHAP. IX.

1. *The Livers heat inferiour to that of the Stomachs.* 2. *Of the natural Spirits in the Liver, and how it is cheriſhed by air.* 3. *Of the Gall, and how it is nouriſhed. How the Choler is conveyed to it; of its two paſſages, and one membrane.*

THough ſanguification and the ſeparation of the three excrementitious humours from the blood, bee the work of the Liver, not of the Stomach, yet it will not follow, that the Liver is hotter then the Stomach: for this work is done not ſo much by heat, as by the temper and conſtitution of the Liver: although I deny not, but heat hath in this its action, which cannot be ſo great in ſeparating the parts of the blood, which is a liquid ſubſtance, as that of the ſtomach and inteſtins concocting hard and ſolid ſubſtances into liquid, and ſeparating the earthy excrements from the purer parts.

II. The Liver ſends by the Veins into all parts of the body, theſe ſpirits which they call natural: for to ſend up the force of the innate ſpirits, which are in every part of the body: theſe natural ſpirits are groſſer then the vital and animal, therfore contained within the thin walls of the veins; and they are begot of blood, and thin vapours, therefore are preſerved and cheriſhed by the blood and air; which air cannot come to the Liver by inſpiration, but only by tranſpiration, which is performed in the hollow of the Liver by arteries in the convex or gibbous part of the Liver, by the continual motion of the Diaphragma.

III. Nature hath faſtned a little veſſel to the Liver, for reception of the choler, which becauſe it is noxious to the Liver, it is thruſt out by it; and becauſe of the ſympathy it hath with that little veſſel, it is drawn in by that by a ſecret inſtinct, as Iron by the Load-ſtone; with which notwithſtanding it is not fed, being a pure excrement: the Lungs indeed

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are fed with cholerick blood, the Spleen with melancholick blood, the Kidneys with watriſh: but not with pure excrementitious choler, melancholy, and water. That Veſſel then is fed by blood, communicated to it by its two veins called *Ciſticæ*, which were not placed there in vain. And though this humour be pernicious to other parts of the body, yet it doth no way hurt this little veſſel, which argues the great ſympathy and familiarity that is between them. 2. The obliquity of the paſſage by which the choler is carried from the Liver to the Gall, is no hindrance to its motion, ſeeing this motion follows not its Elementary form, but the attractive faculty of this veſſel: thus the watriſh blood which is heavy, is drawn upward by the brain. 3. The Gall hath two paſſages, one from the Liver, by which it draws the choler, the other from the *Duodenũ*, by which it thruſts out the choler into the inteſtins, when it becomes offenſive, either by its quantity, or by its acrimony, which it may contract with long ſtay in each of theſe 2 paſſages; there is a *Valvula*, or ſhutter, the one is to keep the reflux of the choler from the gall to the Liver; the other that it may not recoil from the inteſtine into the gall. 4. They in whom the paſſage of the gall reacheth to the bottom of the ſtomach, are troubled with often vomiting of choler; but they in whom this paſſage reacheth below the *Duodenum*, are troubled with cholerick dejections. 5. The Gall, as alſo the Bladder, have but one membrane, whereas the ſtomach and inteſtins have two, becauſe theſe were appointed for concoction, whereas the Gall and Bladder were only made to contain for a time the choler and urine.

CHAP. X.

1. *The uſe of the Gall, and Spleen, its obſtructions, its Veins and Arteries without concavity.* 2. Vas venoſum. 3. *How the Spleen purgeth it ſelf.* 4. *The Veins and its humours.* 5. *Why the ſtone cauſeth vomiting and numbneſs in the thigh.* 6. *The bladder, its attraction and expulſion.*

AS nature hath made the Gall to receive the choler, that the blood may not be therewith infected, as ſometimes it is when the Gall is obſtructed, whence comes the yellow Jaundiſe; ſo it hath ordained the Spleen to receive the groſſe and melancholy blood, that the purer blood may not bee infected with

with it, as it is in the black Jaundiſe. 2. There is no member ſo much ſubject to obſtructions, as the ſpleen, which cannot proceed from its veſſels, for they are capacious; nor yet from its ſubſtance, for that is ſpungy: therefore it muſt be cauſed by the feculency and thickneſſe of blood. 3. It was fitting that the Spleen ſhould abound in arteries, that the groſſe blood thereof might receive the vital faculty, and that it might bee the more attenuated and purged, and the languiſhing heat ther. of excited. 4. It was not requiſite that there ſhould bee any ſenſible capacity in the Spleen, as there is in the Gall and Kidneys, becauſe the melancholy humour is much leſſe then the choler or watriſh, neither was it to be ſent away in that plenty as the other are: Beſides, in ſtead of cavity, it abounds in Veins and Arteries.

II. There is a ſhort veſſell called *Vas venoſum*, reaching from the Spleen to the bottom of the Stomach, and conveying ſome part of the melancholy blood thither, for exciting the appetite, and binding of the bottom of the ſtomach the cloſer for helping of concoction, which it doth being of a cold, ſowre, and ſtipick quality.

III. The Spleen oftentimes purgeth it ſelf, by the internal Hemorrhoids, which ariſe from the Splenetical vein: and ſomtimes by the urine, not through the emulgent veins, which are far diſtant from the Splenetical; theſe having their originall from *Vena porta*, the emulgent from *Vena cava*; but through certain arteries made purpoſely large, not ſo much for carrying of the ſpirits, as of this humour, which is ſtill accompanied with much water for attenuating the thick humour, therefore melancholy men are much given to ſpitting, ſweating, and urine, chiefly in a quartan Fever. Hence melancholy is called water ſometimes.

IV. The Kidneys were made to draw and contain for ſome time the ſerous or watriſh excrement of the blood, which by the Uriters it ſends away to the bladder: but the crude humours which critically are evacuated by urine, are not drawn in by the Kidneys, but ſent thither by the veins; neither is the liquefaction of the ſolid parts in a Hectick, ſent by the veins being weakned, nor drawn in by the reins being againſt nature, but of it ſelf is conveyed thither thorough the capacious veſſels.

V. Such a ſympathy there is between the ſtomach and the reins, by reaſon of the nerves common to both, and of the outward tunicle of the reins ariſing from the *Peritonæum* which

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is joyned to the bottom of the ſtomach, that in fits of the ſtone, we are troubled with vomiting. 2. By reaſon of the muſcle on which the Kidneys lean, which muſcle is inſerted in the inward part of the thigh, and by reaſon of the nerves inſerted in that muſcle, which nerves are preſſed by the hardneſſe of the ſtone in the Kidneys, we find a ſtupidity or numbneſſe in the thigh, in fits of the ſtone.

VI. The Bladder draws the urine to it, not to be fed by the urine, for it is fed by blood; as appears by its veins, but that it may retain it till by its quantity or quality, it grow offenſive, and then it is ſent away, which action both of retention and emiſſion, is partly natural, partly animal: as the urine is retained by the oblique fibres of the bladder, it is natural; as it is retained by the muſcle ſphincter, it is animal; ſo as it is expelled by the faculty of the bladder, this action is natural; but as it is expelled by the muſcles of the *Abdomen*, the action is animal.

CHAP. XI.

1. *The Heart and Teſticles, how the nobleſt parts: Generation without Teſticles, they corroborate the Heart, their ſympathy with the breaſt:* 2. *And with the brain.* 3. *Different veſſels in the Male and Female.* 4. *The Matrix ſympathizeth with the Head, Heart, Breaſts, &c.* 5. *Affected with ſmells. Its twofold motion.*

ARiſtotle will have the Heart, *Galen* the Teſticles, to be the nobleſt parts of mans body: both are in the right; for if we conſider the individual perſon, the Heart is the nobleſt part; but if the propagation of the Species, the Teſticles have the prerogative: for without them there can be no generation in perfect creatures. 2. The Teſticles are not of ſuch abſolute neceſſity for propagation of the Species, as the Heart is for conſervation of the *individuum*. For divers creatures, as Fiſhes, do propagate without Teſticles. 3. The Teſticles, as *Ariſtotle* affirms truly, were not made only, or principally for generation, but for corroboration of the Heart by a ſecret ſympathy and communication of ſpermatical ſpirits and heat; therefore Eunuchs loſe much of their vigour, courage, and maſculine heat. 4. By means of the Nerves, Veins, and Arteries, there is a great communication between the breaſt, and the parts contained in it, and the teſticles; for oftentimes the tumor of the teſticles end

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in a cough, and ſo the cough ſometimes ends into the Teſticles: And hence it is that the voice begins to grow big and hoarſe in young men, as ſoon as they begin to have puberty and ſeed; becauſe the heat of the Teſticles increaſing, dilates the paſſages of the breſt and wind-pipe.

II. As there is a great ſympathy between the ſeminal veſſels and the breſt, ſo there is between them and the brain; hence it is that imagination of venereal objects cauſeth erection, and upon the exuberance of ſeed, there ariſe laſcivious imaginations. 2. Erection is partly animal in reſpect of the muſcles, the imagination and delight; and partly natural in reſpect of flatulency, heat, and ſeminal ſpirits, which cauſe diſtenſion; and of the natural end, which is procreation.

III. The veſſels of generation in the male and female, are not the ſame, as ſome have thought, ſuppoſing they differ only in ſcituation, the one being inward, the other outward; which is not ſo, for they differ in figure, number and ſcituation, as may be ſeen in Anatomies. Therefore theſe ſtories which tell us of maids turned into boyes, are falſe and ridiculous, except they mean Hermaphrodites, in which are the veſſels of both ſexes, which are not diſcerned while they are young, becauſe of the weakneſs of heat in them; ſo at firſt ſome young boyes have been taken for maids, becauſe the yard and teſticles for want of heat, have not appeared outward.

IV. Such a ſympathy and combination there is between the matrix and the head, by reaſon of the nerves; that when the matrix is ill-affected, the head and brains are ill-diſpoſed; and oftentimes the ſenſitive, animal, and motive faculties are overthrown; hence convultions, ſtupidities, and ſtrange diſturbances of the imagination. 2. By reaſon of the arteries, ſuch a ſympathy there is between the heart and the matrix, that ſwouning fits, and ſuffocation, with a ceſſation of pulſe, and reſpiration follow upon the diſtemper of the matrix. 3. Such a conſent there is between the matrix and breſts of women, that ſometimes blood hath flowed from the breaſts inſtead of milk, and milk hath been voided downward inſtead of blood. 4. By reaſon of the conſent between the liver and the matrix: the veins and matrix, the bladder and the matrix: the evil diſpoſition of this is the cauſe of diſtempers and diſeaſes in them.

V. The matrix is much affected with ſmels; not that the ſenſe of ſmelling is there, which is in the brain, but becauſe of the conſent that is between the matrix, and the membranes of the brain; they being both of the ſame ſubſtance; and be-

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cauſe with the ſmell the thin vapors are conveyed thither, on which the ſpirits are fed. 2. Sometimes abortions are cauſed by bad ſmels, becauſe the maternal ſpirits which the child attracteth by the umbilical arteries are infected. 3. Sweet ſmels do cauſe in ſome women hiſterical paſſions, becauſe they ſtir up the pernitious vapors that lay lurking in the matrix, which vapors are conveyed by the arteries to the diaphragma, heart and brain; whereas by ſtinking ſmels nature is ſtirred up to the expulſion both of them, and withall of the naughty humors in the matrix. 4. There is a two-fold motion of the matrix; the one is natural by its ſtraight and circular fibres, ſo it is moved downward towards the reception of the ſeed, and expulſion of the childe and ſecundine: the other motion is convulſive, proceeding from too much inanition or repletion; and ſometimes of venomous vapours, whence are ſuffocations, and want of reſpiration, the diaphragma being preſſed.

CHAP. XII.

1. *Diſtinction of ſexes: the male hotter then the female.* 2. *The ſeed no part, nor aliment of the body: derived from all parts, how.* 3. *The menſtruous bloud no excrement, how it is: The cauſe of the ſmall pox: Its evacuation.* 4. *The uſes of the matrix.* 5. *Its vitioſity, the cauſe of Monſters:* Mola, *what.*

1. AS nature hath appointed generation for continuing of the ſpecies, ſo it hath appointed diſtinction of ſexes, aiming as well at the female, as the male, and not at the male alone, as ſome think, who would make the female an imperfect thing, and aberration of nature: for the one ſex is no leſs needfull for procreation then the other. 2. The male is hotter then the female, becauſe begot of hotter ſeed, and in a hotter place, to wit, the right ſide; and becauſe the male hath larger veſſels and members, ſtronger limbs, a more porie skin, a more active body, a ſtronger concoction, a more couragious minde, and for the moſt part, a longer life; all which are effects of heat. Beſides that, the bodies of males are ſooner articulated and conformed, to wit, by 10 days, in the womb, then the females are; the motions of the male in the womb, are quicker and ſtronger, then of the female. The fatneſs, ſoftneſs, and laxatie of the womans body, beſides the abundance of blood, which cannot be concocted and exhaled for want

want of heat, argue that ſhe is of a colder temper then the man: She indeed hath a ſwifter pulſe, becauſe of the narrowneſs of the arteries, and her proneneſs to anger and venery, argue imbecility of minde, and ſtrength of imagination not hear. 3. The male groweth ſlower then the female, becauſe he was to live longer; therefore nature proceeds the ſlower, as we ſee in trees and plants; a Cherry-Tree groweth up ſooner then an Oak, and decayeth far ſooner. Beſides, the ſoft and looſe fleſh of the female is ſooner extended, then the ſolid and harder fleſh of the male: We may then conclude, that the male is hotter intenſively; but the female by reaſon ſhe hath more blood, is hotter extenſively.

II. The ſeed is no part of the body, becauſe the body is not more perfect by its preſence, nor maimed by its loſs or abſence; nor is it the aliment of the body, becauſe then the body would not part with it: nor is it properly an excrement peccant in the qualitie; but it is the purer part of the blood, or quinteſſence of it, unuſeful for the body when it is peccant in the quantity. 2. Becauſe the blood is in every part of the body, and the ſeed is the quinteſſence of the blood; therefore the ſeed may be ſaid to be derived from all parts of the body, for all parts of the body conſume upon much evacuation of ſeed; and as it is from all parts, in reſpect of its material and groſſer ſubſtance, ſo it is principally from the head, heart, and liver, in regard of its more aerial parts.

III. Though the menſtruous blood may receive corruption by its long ſuppreſſion, or by the moiſture of ſome bad humors, yet in ſound women, it is as pure as any other blood in the body: For it is appointed by nature for nutriment of the infant, whilſt it is in the womb; and after birth it is converted into milk, neither doth it differ from other blood in its material and efficient cauſes; beſides that, it is as red, and coagulates as ſoon, as the pureſt blood of the body: Neither doth nature ſend it away becauſe it is peccant in the quality, but becauſe it is exuberant in the quantity. 2. By reaſon the menſtruous blood is infected with ill humours, on which the child in the womb feeds; hence it is, that there are few or none, but one time or other are infected with the ſmall pox; which as divers other poiſons, doth not preſently ſhew it ſelf, but lieth a long time lurking in the body: And if at the firſt time, the venome of this diſeaſe is not thoroughly purged out, it returns: Hence it is, that ſome have this diſeaſe divers times. 3. The menſtruous blood is not the cauſe of the ſmall pox,

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whilſt it remains in the veſſels, but when it is converted into the ſubſtance of the body; hence it is, that women whoſe moneths are ſtopped, are not infected with this malady. 4. This blood is evacuated once in a moneth ordinarily, at ſuch time as the Moon, which hath dominion over humid bodies, is moſt prevalent: Nature alſo obſerves her own periods, and times of evacuation, of which we can give no reaſon. But this is certain, that if the evacuation of this blood were as frequent as of other excrements, there would be no conception.

IV. The chief uſes of the matrix are to draw the ſeed to it, to mingle it with the blood, to contain it, to excite its faculties and ſpirits, for it is not actually animated till now, and ſo the ſeed by its ſpirits is made capable of animation, and ſhortly after being incorporated with the blood of articulation: Theſe fore-named functions of the matrix are performed, not ſo much by its heat, as by its natural temper.

V. Oftentimes the vitioſity of the matrix is the cauſe of monſtrous births; ſo likewiſe is the imagination, the defect or exuberance of ſeed; the unlawful permiſtion of ſeeds, the heat of the body, and the formative faculty. 2. The falſe conception called *Mola*, is begot when the ſeed is faulty, weak or deficient, and the blood predominant; which is known from a true conception, becauſe there is no milk in the breaſts, when there is a falſe conception, neither doth it move after the fourth moneth, as the child doth; ſometimes it is moved by the matrix, but not by it ſelf, as the child: beſides it remains after the eleventh moneth, which is the time prefixed for the birth of the child.

CHAP. XIII.

1. The Heart liveth firſt, not the Liver. 2. The outward membrans firſt formed by the heat of the matrix. 3. Urachos, what. 4. The ſimilitude of the parents on the children. 5. Twins, how begot, and why like each other. 6. Infants, how fed in the matrix. 7. Superfetation. 8. No reſpiration in the matrix. 9. The childs heart moveth in the matrix.

1. ARISTOTLE will have the heart to be the firſt member that lives in us, *Galen* the liver; but indeed *Ariſtotle* is in the right; for how can any thing live, till the heart which is the fountain of heat and ſpirits live; and how can the

ſoul frame to her ſelf a fit habitation for exerciſing of her functions, till firſt ſhe hath framed the heart, by whoſe heat and ſpirits ſhe may work: If it be objected, that the heart cannot live without nutrition; but nutrition is by blood, and this by the liver, therefore the liver muſt firſt live: I anſwer, that there needs no nutrition, till the body be compleat and perfected; for wee ſee imperfect creatures can live long without food: I have kept a Spider nine moneths alive in a glaſs without food: Again, there needs no nutriment, but when there is deperdition and waſture of the ſubſtance, which cannot bee of the heart, before the body be perfected. And although the body live at firſt the life of a plant, it will not therefore follow, that the heart is not firſt framed; for even in plants there is a principle of life, which is the root, and nature worketh methodically, by quickning that firſt, which muſt quicken the reſt.

II. As the heart is the firſt member that is framed by the formative faculty, ſo the outward membranes are firſt formed by the heat or natural temperament of the matrix, as we ſee the outward skin of fruits by the heat of the Sun. For nature providently fences the ſeed with theſe walls, that the inward ſpirits may work the more powerfully, and be the leſſe ſubject to diſſipation.

III. Beſides the umbilical vein and the two umbilical arteries, nature hath made a veſſel called *Urachos*, by which the child in the matrix conveys the urine into the membran, for it reacheth from the bottom of the bladder to the navel; and in thoſe in whom the navel is not well bound at firſt, and this *Urachos* dried, upon any ſtoppage of the bladder, the urine will flow out by the navel.

IV. The ſimilitude of the parents is impreſſed on the children, partly by reaſon of the formative power in the ſeed, and partly by the imagination of the parent moving the ſpirits, which being mixed with the blood on which the child is fed; makes the impreſſion upon the tender fleſh of the infant. 2. The childe reſembleth the grand-fathers or grand-mothers ſometimes, as the Load-ſtone communicates its power to the third or fourth needle, ſo doth the formative faculty of the grand-father, which is potentially in the ſeed of the grand-childe, oftentimes ſhow it ſelf.

V. Twins are oftentimes begot, partly becauſe of the abundance of ſeed, partly by reaſon of the ſcattering thereof into divers parts of the matrix, which foments each part of it; for though the matrix hath no cells, yet it hath a right

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and a left ſide; in the right, males; in the left, females are begot; or if the ſeed be ſtrong, vigorous, or maſculine, males, if weak and feminine, females; if one part maſculine, the other feminine, then male and female are ingendred; but the female is ſeldome ſtrong or lively, becauſe the time of conformation is not alike in both, 30 days being required for the forming of the male, and 40 for the female. 2. Twins are like each other, becauſe they are wrapped within the ſame membran, are conceived at the ſame time, they feed on the ſame blood, and enjoy the ſame maternal ſpirits.

VI. The infant in the womb is not fed by the mouth, but by the navel; for there are no veſſels that reach to the mouth, neither is there need of chylification, or ſanguification; neither is there any other excrement found in the inteſtins of new born infants, except the excrement of blood; therefore as they breath by the umbilical arteries; ſo they are fed by the umbilical vein.

VII. Sometimes there is ſuperfetation; for we read of ſecond births, ſome days, weeks, and moneths, after the firſt; which ſhews, that the matrix after conception, is not ſo faſt bound, but that it openeth again in copulation, but ſeldome is the ſecond birth either ſtrong or lively; becauſe the firſt conception groweth ſtrong and big, drawing the blood or nutriment to it, by which means the ſecond conception is ſtarved.

VIII. The infant doth not, cannot, ſhould not breath whilſt it is in the womb, but is content with tranſpiration by the umbilical arteries. For if there were inſpiration, there muſt be air within the membrane where the child lieth, but there is nothing except the child, and that watriſh ſubſtance in which it ſwims; this muſt needs be ſuck'd in with the air, and ſo the childe be choaked. Beſides, the redneſſe and groſſeneſſe of the lungs, whilſt the childe is in the womb, ſhews, that it breaths not; for the lungs of thoſe creatures that breath, are of a whitiſh colour, and of a ratified ſubſtance, for the better reception of the air.

IX. Whilſt the child is in the womb, the heart is not idle, as ſome *Galeniſts* imagine, but according to *Ariſtotle*, it then moveth and giveth life to the body: otherwiſe the childe ſhould live all the while the life of a plant, not of an animal, if it had no other life then what it hath from the mother by the umbilical arteries. 2. How could the heart, having no air to refreſh it within that narrow membran, in which the child lieth, receive refrigeration, if it did not move; ſome anſwer, that

the heart is refrigerate by the water in which the child lieth. I ſhould like this anſwer well, if that water were cold; or if the child were a fiſh, which with its gils might receive water for refrigeration of the heart. 3. The arteries of the child move, but how can they move without the heart move alſo. If they ſay, that they are moved by the Arteries of the mother, I would know how they can move after the mother is dead; for ſome children have been cut out alive from the dead mothers womb. 4. Although the umbilical arteries convey the material ſpirits to the child, yet they give not life, no more then the aire which we breathe, till they be refined by the heat and motion of the heart. 5. The animal ſpirits of the childe are begot in its brain, whilſt it is in the womb; but the animal ſpirits have their original from the vital.

CHAP. XIV.

1. *Child-bearing how cauſed.* 2. *Why the eight months birth not lively.* 3. *The ſenſitive Soul how derived, and the reaſonable introduced: when it exerciſeth its functions: it brings with it all its perfections. The Embryo not capable of three ſpecifical forms.*

THE birth of the child is cauſed partly by its calcitration, breaking the membranes in which it lieth, having now need of more food and ſpirits, by reaſon it is grown bigger and ſtronger; and partly by the contraction of the matrix, endeavouring to be rid of the burthen; if either of theſe fail, the birth will be the more painful and difficult; but the *Mola* having neither life nor motion, and not ſtanding in need of air and food, remains in ſome many years together before it be expelled. 2. The cauſes of difficult child-bearing, are partly the bigneſs of the child, partly the narrowneſs of the neck of the matrix, or the weakneſs of the child, or the mother, or inflammations, or tumors, and ſuch like infirmities, whether natural or adventitious.

II. The reaſon why the childe which is borne the ſeventh moneth, is for the moſt part lively, whereas that which is born in the eighth moneth is not, becauſe the ſeventh moneth the child having attained the perfection of parts, and ſo much ſtrength as to break the membrans, doth live; but if it cannot break the membran till the 8 month, all the time it remains frō the firſt attempt it made of going forth, it doth not proſper, but decays in ſtrength, being as it were againſt its will kept in priſon.

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III. The ſenſitive Soul is derived with the ſeed from the parents; which ſoul is potentially in the ſeed, but actually in the Embryo, where the members are formed. But in the fourth month after the heart and brain are perfected, the reaſonable ſoul is introduced; which if it were taken out of the matter, it ſhould in reaſoning and underſtanding depend altogether on the matter, which were abſurd to think. 2. The rational ſoul doth not exerciſe its functions, untill the ſuperfluous moiſture of the body, by the natural heat, be exhauſted, and the organs made drier. 3. The bodies of other creatures, are not capable of mans ſoul, becauſe they are not of that fabrick, temper, and conſtitution. 4. The faculties of the animal ſoul have not their originall from the groſs and earthy part of the ſeed, but from the aereal, by means of its celeſtial heat. 5, The rational ſoul bringing with it all its perfections, the former faculties of ſenſe and vegetation which were in the Embryo, give place to it; ſo that now it alone works by its faculties. 6. The ſeed brings with it from the parents, its own heat, by which the formative faculty worketh; the heat of the matrix is not operative, but conſervative of the other heat. 7. The ſeed conſiſting of groſſer, and aereal parts, cannot be called uniform; and if it were, yet it may have divers operations and faculties *ad extra*; ſo hath the Sun, and other uniform bodies. 8. The Embryo is not capable of three ſpecificall forms or ſouls; for ſo it ſhould be a threefold compound ſpecifically diſtinct; but it is capable of divers generical forms and ſubordinate, the ſuperior being preparatives for reception of the inferior and ultimate ſpecificall form, which giveth name and entity, as the rational ſoul doth to the child being perfected.

CHAP. XV.

1. *Why about the fourth month milk is engendred, and of what.* 2. *The effects of the* Diaphragma *inflamed.* 3. Pericardium. 4. *The Hearts Fleſh, Fibres, and Ventricles.* 5. *The Heart why hot and dry.* 6. *The vital faculty.* 7. *The vital ſpirits how ingendred.* 8. *Syſtole and Diaſtole.* 9. *The Hearts motion.* 10. *How cauſed.*

AS ſoon as the child groweth big, about the fourth month, the menſtruous blood flowes upward to the breaſts, and when the child is born, it flowes from thence; and being

ſuck'd by the child, the veins of the breaſts do avoid vacuity, draw the blood upward for generation of new milk. 2. In the breaſts of Virgins, and of ſome men alſo, there is ſometimes found a whitiſh liquor, which is not milk, becauſe it hath neither the taſt, nor thickneſs, nor nutritive quality of milk. 3. The breaſts, or paps, are glandulous bodies, principally ordained for generation of milk; and in the ſecond place for reception of excrementitious humors, and guarding of the heart. 4. The reaſon why about the fourth month the blood flowes upward into the breaſts, is, that the child growing big, and wanting ſufficient food, might ſtruggle to get out, which it would not do having ſufficient nutriment. 5. It is not fit that the child out of the womb, ſhould feed on blood as it did in the womb, becauſe then the mouth of the veins being opened, the blood would run out, and ſo nature be overthrown; neither would God accuſtom man to blood, leſt he ſhould become cruel and beſtial.

II. Upon the inflammation of the diaphragma, follow oftentimes phrenſies, by reaſon of the ſociety it hath by the nerves with the brain, to which it ſendeth fumes and hot vapors: which phrenſie is known from that of the brain, by the ſhortneſs of the breath, the chief organ of breath being ill-affected, ſo that the breaſt cannot freely move it ſelf: and becauſe the Diaphragma is united to the Pleura, and Peritonæum, which containeth all the organs in the inferiour belly: hence all theſe parts are drawn upwards by the motion of the Diaphragma.

III. The tunicle of the heart, called *Pericardium*, hath within it a water for refrigeration and moiſtning of the heart, which is begot of vapours, condenſate by the coldneſs of the membrane, as ſome think, or elſe it ſweats through the tunicles of the veins and arteries: they that have hot hearts have but little of this water, and it abounds moſt where the heart is colder; but whether the defect of this water be the cauſe of the heat in the heart, or the heat the cauſe of this defect, it is uncertain, as it is with the ſea-water, which is turned into vapours by the ſuns heat, and theſe vapours turned into water again by the coldneſs of the middle Region: ſo the heat of the heart turns this water into vapours, and the membrane converts theſe vapours into water again, and ſo this circulation continues till the heat of the heart be extinguiſhed by death, then is found water onely.

IV. The heart hath a peculiar hard fleſh of its own, that it might

might be the better able to undergo its perpetual motion, to contain the ſpirits and life-blood, and to reſiſt external injuries. 2. This fleſh is not muſculous, becauſe the motion of the muſcles is voluntary, but the hearts motion is natural. 3. The heart hath both ſtraight, tranſverſe, and circular fibers, for attraction and expulſion; and oblique fibers alſo for retenſion; but theſe fibers are of the ſame ſubſtance with the heart, and not of a different, as the fibers of the Muſcles, which are parts of the nerves and Tendons. 4. The heart is fed with groſs blood, anſwerable to its own groſs ſubſtance, by the vein called *Coronaria*, compaſſing the Baſis of the heart. 5. The heart hath two ventricles, whereof the right is hotteſt extenſive, as *Ariſtotle* will have it, for it contains the life-blood; the left is hotteſt intenſive, as containing the vital ſpirits, and ſo *Galen* ſaith. 6. If we conſider the ſituation of the right ventricle, which is in the right ſide, and the priviledge it hath in living longer then the left; we may with *Ariſtotle* ſay, that the right ventricle is the more noble of the two; but if we conſider that the left ventricle contains the vitall ſpirit, which in dignity excels the blood which is in the right, we muſt with *Galen* give the preheminence to the left: and ſo theſe two may be reconciled.

V. The heart is a hot and drie ſubſtance, that it might be the fitter both to beget and to preſerve the vital ſpirits; to attenuate the venal, and to procreate the arterial blood: And though the ſpirits be hotter extenſively, yet the ſubſtance of the heart is hotter intenſively; as burning coles are hotter then flaming ſtraw.

VI. The vital faculty by which the vital ſpirits are ingendred for animating the body, and preſerving the natural heat, is an effect of the ſoul, as all faculties are, and not of the heart; yet here it chiefly reſides, becauſe of the ſoul which here exerciſeth her chief functions of life. 2. This vital faculty differs from the animal, becauſe it is not ſubject to fatigation, nor reſts in ſleep, nor doth it accompany the imagination or apprehenſion of the object, as the animal doth. 3. It is different from the pulſifick faculty, becauſe this is ſubſervient to the vital; neither doth the pulſifick beget ſpirits, or is it diffuſed every where as the vital is. 4. The vital differs from the vegitive faculty, becauſe the vegitive is in plants and inſects, but not the vital, as it is procreative of ſpirits: for the dull heat of inſects is not ſo ſoon ſpent as to need reparation by generation of ſpirits. 5. It differs from the animal motive faculty,

becauſe it is neceſſary and perpetual; the animal is voluntary, and ſometimes ceaſeth.

VII. The vital ſpirits are ingendred in the left ventricle of the heart, partly of aire prepared in the lungs, and conveyed to the heart by the *Arteria venoſa*; and partly of the pureſt blood, powred out of the mouth of *Vena cava* into the right ventricle, where it is prepared and attenuated, a part whereof is conveyed for nouriſhing of the lungs by the *Vena arterioſa*, the other part ſweats through the partition that divides the heart, and in the left ventricle is mingled with the aire, and turned into ſpirits by its exceſſive heat.

VIII. The Diaſtole and Syſtole, that is, the dilatation and contraction of the heart and arteries, is all one and at the ſame time: for the heart and arteries are ſo united, that they make but one body; ſo there is but one pulſifick vertue in both, and the end of their motion is the ſame, to wit, the vegitation and life of the body; the ſuddenneſs of the motion in the remoteſt arteries from the heart, and the ſtrong beating of the pulſe and heart in Feavers and anger, do ſhew the identity of motion in both. 2. The arteries are moved by the ſpirits of the heart, conveyed by their tunicles rather then their cavity; for upon the preſſing of the tunicles the pulſe ceaſeth; but not when the cavity is ſtuffed, or ſtopped. They are not then moved by their heat and blood, but by the heart; as may be ſeen by binding the arteries, whoſe motion beneath the binding faileth, the commerce between it and the heart being intercepted. 3. The heart is firſt dilated by receiving the aire, then it is contracted by expelling the fuliginous vapours. 4. The heart ſtrikes the breaſt in its dilatation, not in its contraction or Syſtole; becauſe the left ventricle, which is the originall of the Arteries, is diſtended in the Diaſtole, and ſo toucheth the breaſt about the left pap.

IX. The motion of the heart is not voluntary, becauſe we cannot command it; nor ſenſitive, becauſe it is not performed by the nerves and muſcles; nor ſimple, becauſe there are two motions; nor compounded, becauſe they are contrary; and of contrary motions can be no compoſition; nor is it violent, becauſe it is not repugnant to its nature; nor is it cauſed by an externall agent, as the trembling of the heart is by diſtempers, vapours, or humours; but the hearts motion is natural, yet not cauſed by the elementary form, for ſo there ſhould be more agents in our bodies then one, and its motion ſhould be either upward or downward; but it is natural in reſpect of the

ſoul,

ſoul, which is the chief nature that works in animal bodies; and in reſpect of the fibers heat, and ſpirits of the heart, which are natural organs; and in reſpect of the natural uſe or end of this motion; for the heart dilates it ſelf to receive aire and blood; it contracts it ſelf to be emptied of its fumes, and to communicate its ſpirits to the nerves; which ends are naturall.

X. When *Ariſtotle* ſaith, that the motion of the heart is cauſed by heat and cold, he contradicts not the Phyſitians in affirming the ſoul, or its vital faculty to be the cauſe of this motion; for heat and cold are ſubordinate inſtruments to the ſoul, which by the heat of the blood and ſpirits, dilates the heart, and by the attraction of the cold air contracteth it, as we ſee water by the heat of the fire ſwel and dilate it ſelf, but upon the breathing of cold air, to contract and fall down again.

CHAP. XVI.

1. *The Lungs how moved; the air is not the ſpirits nutriment.*
2. *Reſpiration not abſolutely neceſſary.* 3. *The Lungs hot and moiſt.*
4. *Reſpiration a mixed motion, as that of the bladder and inteſtins.*
5. *No portion of our drink paſſeth into the Lungs.*

Ariſtotle differs from the *Galeniſts* about the motion of the Lungs; he will have them moved by the heart, whoſe heat liſteth up the Lungs, upon which motion the air enters for avoiding vacuity; which being entred, the Lungs fall. The *Galeniſts* will have their motion to depend on the motion of the breaſt, but both are in the right: For the motion of the Lungs is partly voluntary, and ſo it depends on the moving of the muſcles of the breaſt; and partly natural, and ſo it is moved by the heart. 2. When *Ariſtotle* denies that the air is the nutriment of the ſpirits, which the *Galeniſts* affirm; his meaning is, that the air doth not properly nouriſh the ſpirits, as meat doth our bodies; for there is no aſſimilation or converſion of the ſubſtance of the air into our ſpirits, which are properly nouriſhed by blood, but only a commixtion of the air and ſpirits for refrigeration: And indeed if the ſpirits were properly fed by the air, there would not come out the ſame air that went in: For the ſpirits would not part from their food; the air then nouriſheth the ſpirits, as it doth the fire, by refrigeration, and preſerving it from ſuffocation.

II. Reſpiration is not ſo neceſſary for preſervation of life, as

as the motion of the heart : for hiſterical women can live without that, but they cannot live without this : Neither is the motion of the arteries of abſolute neceſſity; for the member is not deprived of life, though the arterie be ſtopped or tied, and deprived of its motion. 2. The motion of reſpiration is more noble then the motion of the heart, becauſe this is meerly natural, that is alſo animal and voluntary; yet as the motion of the Lungs is ſubſervient to the motion of the heart, that is more noble then this : for the end excels the means.

III. The Lungs are hot and moiſt : hot, that they might temper and alter the cold air, therefore the ſubſtance is fleſhy, light and ſpongy, and fed with hot and ſpirituous blood from the right ventricle of the heart. It is alſo moiſt, as appears by its ſoft and looſe ſubſtance : It is alſo moiſt accidentally by receiving the flegme and rhumes that fall from the brain. 2. The Lungs refrigerate the heart, not becauſe their ſubſtance is cold, but becauſe the air is cold which they attract.

IV. Reſpiration is a motion partly voluntary, as it is performed by the muſcles, nerves, and diaphragma, which are the organs of voluntary motion, and as it is in our power to breath or not to breath; to haſten or retard it : And it is partly natural, as it is performed by the Lungs, which are organs of natural motion, as it is not ſubject to fatigation, as it is performed in our ſleep, when we have no command over our ſelves, and the ſenſitive faculties then ceaſe; as it is not performed by election, or apprehenſion of the object, as voluntary motions are : And laſtly, as in Apoplexies, when the ſenſes fail, the brains and nerves are hurt, yet reſpiration continues; it is then a mixt action, as the expulſive actions of the bladder and inteſtines are. So is the motion of coughing; for as it is performed by the muſcles, it is animall, but as it is ſtirred by the expulſive faculty, it is naturall; and as it proceeds from ſome morbifick cauſe, it is preternatural. So deglutition or ſwallowing is an animal action as it is performed by the muſcles, and is ſome times hindred by imagination; for we ſwallow with much adoe, thoſe things of which we have no good conceit. It is alſo natural, as it is performed by the attraction of the fibres which are in the external tunicle of *Oeſophagus*. Now attraction is ſubſervient to the nutritive faculty, which is naturall.

V. That no portion of our drink can paſs into the lungs, is plain; becauſe we cough if the leaſt drop of rhume fall from the head upon the lungs: beſides, our breath and voice ſhould be preſently ſtopped, the light and ſpongie ſubſtance alſo of the lungs, would

would be hurt and corroded when we drink any ſharp or ſoure liquors, or medicaments: Therefore in ſwallowing, the *Epiglottis*, or little tongue of the wind-pipe covers the *Larinx* or top of the *Aſpera arteria*, that nothing may fall into it; yet the ſides of *Aſpera arteria* are moiſtned by ſyrrups, which ſomewhat eaſe our coughing.

CHAP. XVII.

1. *All the ſenſes in the brain.* 2. *How made for refrigeration only, how hot, cold, and moiſt; and why; its actions.* 3. *How void of ſenſe and motion.* 4. *The animal ſpirits, what, and how begot.* 5. *Why more vital then animal ſpirits; where perfected, and prepared, the ventricles of the brain.*

AS the heart is the firſt, remote, and mediate originall of motion and ſenſe, becauſe the ſpirits and heat are originally from thence, ſo the brain is the ſecundarie, proximate, and immediate organ of the ſenſes, which have their particular ſeats there; to wit, the 5 externall ſenſes, and the 4 internal, namely, the common ſenſe, the imagination, the diſcurſive, and memorative qualities, which have their diſtinct cels. The common ſenſe is placed in the ſubſtance of the brain, the imagination in the fore cel, the diſcurſive in the middle, the memorative in the back cell; the fore cell is ſofter, the back cell ſomewhat harder, the middle is of a middle temper; ſometimes the one is hurt, when the other is ſound, a good memorie may accompany a bad imagination; and contrarily.

II. When *Ariſtotle* ſaith that the brain was made only for refrigeration of the heart, his meaning is not as the *Galeniſts* think, that the brain was made for no other uſe, but that neither the brain nor heart could be any way uſeful, if the heat of the one were not tempered by the cold of the other; for all our frame is out of order, when the brain is overheated or inflamed; and though the brain be not actually cold, yet by its moiſture and weak heat, it tempers the exceſſive heat of the heart and vital ſpirits, by means of the arteries which are common to both theſe organs; therefore it is that the brain hath not blood and veins. 2. The innate temperament of the brain is cold, the adventitious is hot; that is, it is hot by means of the ſpirits from the heart, but cold in its own ſubſtance. 3. It was made cold and moiſt, that being the ſeat of imagination, and of the attenuated animal ſpirits, the one might not be diſtempered with heat, nor the others diſſipated. 4. It is moiſt, that it might be the fitter for generation

generation of the nerves, for receiving the images and impreſſions of things with the more facility, and the more apt for ſenſation, which conſiſteth in paſſion. 5. The actions and functions of the brain depend both upon its right fabrick and conformation, as alſo upon its temper; for if either of theſe be hurt, the actions of the brain are vitiated.

III. The brain is void of ſenſe in its own ſubſtance, but ſenſitive in its membranes; nor was it fit that the brain ſhould feel, ſeeing it is the common receptacle and judge of all the ſenſes: and ſeeing it is in the higheſt place, and receives all exhalations from the inferior parts, it ſhould be continually moleſted, if it were ſenſible of all theſe vapours. 2. As it is void of ſenſe, ſo it is of motion in it ſelf, it is indeed moved by the arteries, for the feeding, purging, and tempering of the animal ſpirits; but the brain being the original of motion, ought to be immovable in reſpect of ſelf motion, neither are there any fibres in the brain by which it ſhould be moved, as there are in the heart; neither could ever the motion of the brain be obſerved, other then what is cauſed by the arteries.

IV. The animal ſpirits are ſo called, becauſe they are the chief organs of the ſoul, for her chief actions of ſenſe and motion without the brain: of imagination, diſcourſing, and remembring within the brain; therefore theſe ſpirits receive from the ſenſes, the images and ſpecies of things, and convey them to the brain, where they retain them for the ſoul, by the phantaſie to work upon. 2. Theſe animal ſpirts are begot of the vital, but are cheriſhed and refreſhed by the external air, drawn by the noſtrils to the brain; ſo that without air, and vital ſpirits, the animal canot long ſubſiſt; and becauſ blood is the remote matter of the animal ſpirits, they grow feeble when much blood is evacuated.

V. Becauſe there is more need of the vital then of the animal ſpirits, therefore more plenty is required of them then of theſe; for nothing is begot of the animal ſpirits, therefore they waſte not ſo faſt as the vitall, of which the animal are ingendred; beſides, the vital ſpirits are perpetually imployed even in ſleep, ſo are not the animal, but they reſt then, nor is there any part of the body which hath not life; but divers parts have not ſenſe, which is an animal function, as the bones and ligaments. 2. The animal ſpirits are prepared in the intricate labyrinth of arteries within the brain; but they receive their perfection in the cels thereof. 3. Though the faculty of ſenſe be an inſeparable property of the ſoul, yet it doth not always operate, but where there is a fit organ; in ſleep the ſoul is in

the

the eye, but then ſeeth not. 4. The ventricles of the braine ſerve not onely for generation of the ſpirits, but for purging out alſo of ſuperfluous excrements.

CHAP. XVIII.

1. *The eye both watriſh and fiery, imperfect viſion.* 2. *Why the eye is watriſh, its action, ſpirits, and ſpecies.* 3. *Spirits of the eye proved: two eyes, but one motion; why the object appears double ſometimes, no colours in the eye.* 4. *The optick nerves ſoft, where united, and why.* 5. *The Chryſtalline, and glaſſy humours, and white of the eye.*

THough the ſubſtance of the eye be watriſh, as we ſhewed before, yet the viſive ſpirits are fiery, as may be ſeen by their light in the dark, their mobility, and their reſiſtance to cold, for they are not moleſted with it as other members are. 2. When the imagination is vitiated, or the ſpirits ſubſervient to the ſame are diſturbed, or an opac vapour is interjected between the *Cornea* and chryſtalline humor, wee ſeem to ſee things and colours in the air, which are not there, but this is an imperfect viſion, becauſe there is no reception of ſpecies from the air, nor is the organ diſtinct from the medium and object, nor is there that diſtance between the organ and the object, as is required in perfect viſion.

II. The eye ſhould be of a watriſh ſubſtance, not fiery; becauſe water is denſe and diaphonous, fit to receive the ſpecies as it is diaphonous, and to retain them as it is denſe, ſo is not the fire; for though it be diaphonous, it is not denſe, therefore not fit to retain the ſpecies. 2. The ſpecies being ſpiritual or immaterial, do not affect or hurt the eye, but the colours only hurt the eye more or leſſe, as they participate more or leſſe of the light, which diſſipates the viſive ſpirits, theſe being lucid, ſpend themſelves on lucid objects, by reaſon of their cognate quality. 3. Sometimes the eye is wearied with ſeeing, not as viſion is a reception, and ſo a paſſion, but in reſpect of the viſive ſpirits which are agents. 4. The eye in an inſtant perceives its object, though never ſo far diſtant, becauſe the viſible ſpecies are in the air contiguous to the eye, though the object be diſtant.

III. That there are ſpirits in the eye, is apparent by the dilatation of the Ball of one eye, when the other is ſhut; which is

is caused by the spirit passing from one eye to the other, and by reason of these spirits the eye is more cheerful at one time then at another. 2. Though there be two eyes, and divers muscles, yet they are moved but with one motion, because otherwise one object would appear as two. Thus by lifting up one of our eyes with our finger, the object we look upon, appears double, because the two Balls of the eyes are not upon the same superficies, nor do the beams of both eyes equally reach the object. Thus it is with drunkards and goggle eyes, and in convulsions of the muscles of the eye. 3. There are not properly any colours in the eye, because then the object would seem to be of the same colour that the eye is of; yet the eyes seem to be coloured, because they are visible.

IV. The optick nerves seem of all others the most soft and spongy, that they might bee the lesse offensive to the eye the most tender of all other members, and that they might convey the greater quantity of optick spirits. 2. They are united in to one, about the middle way between the brain, where they have their beginnings, and the eyes into which they are inserted, that by this union they might be the stronger, and that they might be equally implanted into the same superficies of both eyes, lest the visive spirits being unequally communicate, should occasion the object to appear double.

V. The Chrystalline humour is a part of the eye, because it hath its life, nutriment and function; as other parts have; it is also both a similar part in its temper and substance, and it is organical in its situation and figure. 2. The glassie humour is also a part for the same reasons; therefore the Chrystalline doth not feed upon it, for no part feeds upon another, but it prepares the blood, and alters it for the Chrystalline, lest it should be infected with a red colour; it affords then the same service to the Chrystalline, which the stomach doth to the liver. 3. The white of the eye is a part thereof, and no excrement, for Nature excludes excrements; but if this white should perish, sight faileth, for it is as a Bulwark to the Chrystalline, and conveyeth the species to it.

CHAP.

CHAP. XIX.

1. *Five things required to hearing.* 2. *Not the real but intentional ſound is heard: Hearing fails laſt in drowned men.* 3. *The innate air no organ of hearing: no ſpirit, or part of the body.* 4. *The cauſ of the ſympathy between the ear and the mouth.*

I. FOR the ſenſe of hearing are required, 1. A ſound, which is cauſed by the colliſion of two ſolid bodies, or of the air and of another body. 2. Air which is the medium that receiveth and carrieth the ſound, whereas the water in reſpect of its thickneſs carrieth the ſound but imperfectly and dully. 3. The ear containing in it the thin and dry membrane called the drum, which if it be thick, or too much moiſtned, hindreth hearing. 2. Three little bones called *Incus*, *malleus*, & *Stapes*. 3. An innate and immoveable air. 4. A winding labyrinth, that the external air and ſound may not too ſuddenly ruſh in upon the nerve of hearing. 5. This auditory nerve carrieth the ſound to the brain, that there the common ſenſe and fantaſie may judge thereof.

II. The ſound which is carried into the ear is not real, but intentional and ſpiritual, or the ſpecies and image of the real ſound; for how can a real ſound paſſe through a thick wall, or multiply it ſelf in a thouſand ears, in an inſtant, or in ſo ſhort a time, reach twenty miles from any canon to the eare. 2. The winding labyrinth in the ear is the cauſe, why men that are drowned loſe the ſenſe of hearing laſt, becauſe the water cannot paſſe through that winding *Meander*.

III. The innate air of the ear is not the organ of hearing, but a medium, for it differs not from the external air, nor can that be an organ which is no part of the body, either ſpermatical or ſanguineal, as Phyſitians uſe to ſpeak, neither is it animated by the ſoul, for the ſoul is the act of organical bodies onely: Nor is it a ſpirit either animal or vital, becauſe it is not contained within the nerves or arteries; and being it is not a mixed, but a ſimple body, it can be no part either ſimilar or diſſimilar.

IV. By reaſon the auditory nerves do impart ſome branches to the tongue; hence it is, that there is ſuch a ſympathy between the ear and mouth. That this is a help or hindrance to our hearing, and this to ſpeaking, ſo that if the auditory nervs be ſtopped or deficient, not onely deafneſs but dumbneſs is cauſed;

ſed; and we finde that thoſe who hear hardly, ſpeak little, and ſuch as are born deaf, are born dumb too: and if we hold a muſical inſtrument with our teeth, and ſtop our ears, we ſhall hear the ſound perfectly.

CHAP. XX.

1. *How wee excell the beaſts in ſmelling. Wee ſmell reall odours.* 2. *Smells nouriſh not.* 3. *The noſe, not the brain is the organ of ſmelling.*

I. THOUGH the beaſts excel us in the ſenſe of ſmelling in reſpect of celerity, and way of reception, yet in reſpect of dijudication, and differencing the diverſities of ſmells, wee exceed them: for our brains being bigger, colder, and moiſter then thoſe of beaſts, cannot ſo quickly receive the ſmell. But becauſe of the reaſonable ſoul, we judge better of the differences. 2. Though the ſpecies of colours and ſounds are received into the eyes and ears, yet real odours are received into the noſe; for the head, heart, and ſpirits, are diverſly affected with ſmells; ſome men have been cheriſhed a long time with them; ſome women are ſuffocated with ſmells; ſome beaſts are driven away; ſome are allured by them; which could not be if theſe were not real ſmells, and in that ſmells are carried to and fro with the windes: And that we ſmell better in hot weather then in cold, doe ſhew, that theſe are not the ſpecies, but real ſmells. 3. Odours being accidents, cannot be conveyed to the organ, but in vapours or exhalation, which are ſubſtances; for bare accidents cannot be tranſported with windes to and fro, nor can they affect the brain, or comfort it, or drive away beaſts and vermin.

II. When *Ariſtotle* ſaith that ſmells cannot nouriſh, he is in the right; for nothing nouriſheth, but compounded bodies, now ſmels are bare accidents. Nutriment have their excrements, ſmels have none; nutriment is converted into the ſubſtances of the body nouriſhed, and hath a peculiar place where it is concocted; as the ſtomach is the place for the Chylus; which cannot be ſaid of ſmels: Therefore *Galen* was in an error, when he ſaid that men can be nouriſhed with ſmels, except by ſmels he underſtand odoriferous exhalations, which yet nouriſh not properly, but for a while only recreate the ſpirits, becauſe of the nearneſs of their ſubſtance, which ſpirits being

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the immediate organs of the ſoul, for a while can perform their functions in the body.

III. Galen is injurious to *Ariſtotle*, in upbraiding him, for making the noſe the organ of ſmell; whereas *Galen* will have the brain to be the organ; which is ridiculous, and againſt his own tenents, in affirming that the brain is no ways ſenſitive; neither indeed can it be, ſeeing it is the original of the ſenſes; and how can the ſame member be both the original and organ of the ſenſes. Therefore not the brain, nor that part thereof which they call (*proceſſus mamillares*) reaching to the noſe, can be the organ of ſenſe, but the noſe it ſelf; for they that want the noſe, ſmel not; and a ſhort noſe ſmels not ſo well as a long; and if any part of the brain were the organ of ſmel, we ſhould ſmel the meats in our mouth, and the vapours of the ſtomach, which are ſtill mounting up to the brain: Yet we never ſmell them till we belch them out, and then we ſmell them as ſoon as they aſcend into the noſe, which is indeed the true organ of ſmell in that nervous membrane thereof. And how can the ſmell be an external ſenſe, if it have not as well as the other four, an externall organ, by which the externall ſenſes are diſtinguiſhed from the internall. 2. Though the real ſmell is conveyed to the noſe, and not the ſpecies, as the ſpecies of colours and ſounds are to the eyes and ears, yet not the real, but the intentional ſmell, or ſpecies is carried by the nerve into the common ſenſe or fantaſie.

CHAP. XXI.

1. *Wherein conſiſts the organ of taſt. The tongue potentially moiſt: no external medium of taſt.* 2. *How the skin is the medium of taſte. The prime qualities, both objects and agents. No creature without tact. It is moſt exquiſite in man. Tact and taſte different.*

THe organ of taſte conſiſteth partly in the nerves of the tongue, palate, and throat, and partly in the skin thereof, except we make the skin the medium; for when the skin of the mouth or tongue peeleth, the taſte faileth; and ſo it doth fail alſo when the tongue is drie without moiſture or ſpittle; therefore the ſpittle or *ſaliva* may be called the medium of taſte. 2. Becauſe the organ muſt be potentially, what the object is actually; therefore the tongue muſt be potentially

moiſt; for moiſture, not drineſs, is the object of taſte. I ſay the tongue muſt be potentially moiſt; for if it were actually moiſt, it could not judge of moiſtures; for the ſenſe ſhould be void of that which it apprehendeth by ſenſation; therefore there is no moiſture nor reliſh in the tongue, for when it abounds with moiſture, or hath in it any reliſh, it loſeth its taſte. 3. The taſte hath no external medium as the other three ſenſes, and in this it agreeth with touching. 4. Though ſapors work materially upon the tongue, yet the act of ſenſation is by reception of the ſpecies, for real qualities cannot be received into the animal ſpirits, and judged by the common ſenſe and fantaſie.

II. The ſenſe of tact either hath no medium, or elſe we muſt make the skin the medium; and the fleſh, membranes and nerves the organ; but indeed the skin is both the organ of tact, as experience ſhewes; and the medium in reſpect of the fleſh and nerves. 2. The four prime qualities, chiefly heat and cold, are not onely the objects of tact, but agents upon them, by warming and cooling the organs; ſo are not the ſecond qualities, to wit, hardneſs, ſoftneſs, aſperity, &c. For theſe are not active at all, except levity in a ſpiritual or intentional way. 3. Though there be many particular objects of tact, as the firſt and ſecond qualities, yet there is but one general object, to wit, the tactile quality. 4. Though this be true, that the ſenſible object put upon the ſenſe, hindreth ſenſation, in theſe ſenſes that have the air for a medium, yet it is not true in the ſenſe of tact, which hath no ſuch medium. 5. The ſenſitive creature can ſubſiſt without any of the five ſenſes except the tact; becauſe this conſiſteth in the proportion and harmony of the prime qualities, which if it fail, ſenſe alſo faileth, and conſequently animality. 6. Of all creatures, the ſenſe of tact is moſt exquiſit in man, becauſe his body is moſt temperate; but tact conſiſteth in the temper of the prime qualities. 7. Though taſte be accompanied with tact, yet they are diſtinct ſenſes both in the organs, media, and faculties; and tact is diffuſed through all the body, whereas taſte is only in the mouth.

CHAP.

CHAP. XXII.

1. *The uſe of the common ſenſe: It is but one ſenſe: The different judgement of this ſenſe, and of the ſoul. How different from other ſenſes. Its in the brain and heart.* 2. *Imagination or fantaſie, what: diſturbed compoundeth. The Eſtimative. Its work and ſeat.* 3. *Memory, how a ſenſe. It is twofold. Reminiſcence, what? Old men and childrens memories.*

AS there be three actions of the ſoul, to wit, dijudication, compoſition, and retention, ſo there are three internal ſenſes; to wit, the common ſenſe, the fantaſie and the memory. The common ſenſe apprehends and judgeth the objects of the outward ſenſes, in which, as in the Center all theſe objects do meet; the eye cannot put difference between colours and ſmels, but the common ſenſe doth; and though the eye ſee, yet it doth not know it ſelf to ſee, that is the work of the common ſenſe; therefore mad men in whom this ſenſe is hurt, ſee, but perceive it not, nor doe they difference the objects which they ſee, but either confound them, or miſtake the one for the other. So when the ſenſitive ſpirits are imployed by the fantaſie, though we ſee oftentimes the object, yet we perceive it not. 2. Though the common ſenſe apprehends diverſity of objects, yet it is but one ſenſe, becauſe its actions in judging or differencing theſe objects is but one: So the eye hath but one action, though it ſeeth many objects. 3. The act of judging in the common ſenſe, is not that of the ſoul, which extendeth it ſelf to things alſo ſpiritual and univerſal, and belongs only to man, not to the beaſts, as the judging of the common ſenſe doth. 4. The external ſenſes apprehend their objects onely preſent, but the internal ſenſes apprehend them being abſent. 5. The common ſenſe is in the brain ſubjectively, for there are the animal ſpirits and nerves, ſo ſaith *Galen*; but in the heart originally, and in its cauſe; for from thence are the vital ſpirits, which are the matter of the animal, and ſo is *Ariſtotle* to be underſtood.

II. The ſecond internal ſenſe is the imagination, ſo called from the images or ſpecies, which it both receiveth from the common ſenſe, and frameth to it ſelf: If the brain be ſound and undiſturbed, it receiveth ſpecies from the common ſenſe only, and judgeth more diſtinctly of them then the common ſenſe doth; it compoundeth alſo and uniteth, and in beaſts it ſerves

in ſtead of reaſon to direct them to their operations; in man it is ſubſervient to the intellect in miniſtring ſpecies to it, therfore it is calied phantaſie, from φαινειν, to ſhine, or ſhew; For as the eye diſcerns its objects by the light, ſo doth the intellect whileſt it is in the body, work and ſpeculate by the phantaſie. 2. In diſturbed brains by phrenſies, fevers, or inordinate ſleep, the phantaſie makes other objects to its ſelf then were repreſented to it by the common ſenſe. 3. The phantaſie compoundeth that which the common ſenſe apprehendeth in a divided way; as I ſee a horſe and a man, and the common ſenſe apprehendeth the ſpecies of both apart; but to conceive them united in a Centaure, is the work of the phantaſie. 4. The eſtimative is not a ſenſe diſtinct from the phantaſie, but the very ſame, whoſe office is to eſteem what is good or hurtful to the creature, and ſo to follow or avoid it, therefore this ſenſe ſtirreth up the appetite. 5. The common ſenſe doth not work but when the outward ſenſes are working; but the fantaſie worketh without them, to wit, in ſleep. 6. The fore part of the brain, in which is the common ſenſe, is humid, as being fitteſt for reception, which is the common ſenſes work; the hinder part is dry, as fitteſt for retention, which is the work of the memory: but the middle part is temperately humid and dry, as fitteſt for reception and retention, both which are performed by the phantaſie. 7. For a right and orderly phantaſie, or imagination, there are required clear ſpirits from vapors, a temperate organ, ſtraight nerves and paſſages, and a moderate heat from the heart; if any of theſe bee deficient, the phantaſie is diſordered.

III. The third internal ſenſe is the memory; not ſo much to be called a ſenſe, as it retaineth the ſpecies; (for in this the nature of ſenſation conſiſteth not,) but as it receiveth them, for ſenſation is properly in reception. 2. This ſenſe is the treaſury, in which are laid up that ſpecies of things paſt, which have been apprehended by the external ſenſes. For as theſe conſider things preſent, and hope things future; ſo doth the memory, things paſt: it is the wax receiving and retaining the ſtamp of the ſeal, and it is a faculty of the ſenſitive, not of the intellective ſoul; for beaſts and birds have memories. As for the intellective memory, it is all one with the paſſive intellect, which is the keeper of the intelligible ſpecies; for it belongs to the ſame faculty to underſtand and to remember. 3. Though in brutes there is memory, yet recordation or reminiſcence is onely in man, becauſe it is joined with diſcourſe

and

and deliberation, which are operations of the intellect; for memory is the retention of the ſpecies, but reminiſcence is a recollecting by diſcourſe and comparing of circumſtances, the ſpecies which he had forgot; therefore a nimble wit and reminiſcence which conſiſteth in diſcourſe, go together commonly, but ſeldome a good wit and a good memory: this requiring a dry organ, the other that which is temperately moiſt. 4. Children have bad retentive memories, becauſe their brains are moiſt, and old men have bad receptive memories, becauſe their brains are too dry: therefore there is required for memory a brain temperately moiſt to receive, and temperately dry to retain the ſpecies.

Finis Libri Secundi.

BOOK III.

Of mans rare Infirmities, or admirable Diſeaſes.

CHAP. I.

1. *Of Eels voided by a maid, and of other ſtrange generations.* 2. *A woman voided in three days, ſix quarts of milk.* 3: *Of women, who have eat mens fleſh.* 4. *Of women that have lived ſome years without food.* 5 *Of one that lived ſome years without a brain; another without a Spleen. Of one that lived with a knife in her skull.* 6. *Of ſome that have ſwallowed knives, glaſſes, &c.* 7. *Of ſome ſhot in the forehead, and the bullet found in the hinder part of the skull.*

HAving briefly diſcourſed upon the fabrick, parts, and paſſages of mans body, I will as briefly touch ſome rare and extraordinary infirmities, with which the bodies of ſome men have been moleſted, and will point at ſuch cauſes, as I conceive may ſtand with the grounds of Divinity and Philoſophy. As for ordinary diſeaſes, with their cauſes, ſymptomes, and cures, I leave to Phyſitians.

1. I read in *Cornelius Gemma*, in his Divine characteriſmes, *l.* 2. *c.* 4. and in *Marcel. Donatus*, his admirable Hiſtories, *l.* 2. *ca.* 1. of a Maid that voided Eels by the ſtool, which I conceive may proceed from a natural cauſe: For, if by the heat of the Sun divers forms are educed out of putrified matter, as Eels out of mud, why may not Eels alſo be generated in mans body by its heat, there being a diſpoſition and preparation in the matter, for reception of ſuch a form. Thus Bees are begot of Calves fleſh, Waſpes and Hornets of Horſes and Aſſes, and divers

ſorts

ſorts of Worms in our bodies. I have read of a Bird found in an Oyſter, which was preſented to *Francis* the firſt of *France*. I will not ſpeak of the Barnecles in the Scottiſh Seas, begot of old rotten planks of ſhips; nor of him that had a golden tooth, which if it were not perfect gold, it might in ſome qualities reſemble it; as pins that have been voided in Impoſthumes: For ſtones begot in the bladder and kidneys, and chalk in the joints of gouty bodies, are not ſo rare.

II. I read in *Martin Wienrich*, in his book of Monſters, of a woman whoſe milk did ſo abound, that in the ſpace of two or three days ſhe voided a gallon and an half, of which was made very ſavory Butter and Cheeſe. Though this be rare, yet it is no miracle; for that woman abounding much in blood, muſt alſo abound in milk: And ſome Livers are of that conſtitution and temper, that they ſanguifie much more then others; eſpecially in conſtitutions that are inclined to cold and moiſture; for hot and dry bodies have but little blood, and therefore little milk; and where there is much ſweet flegm, or rhume it is eaſily converted into blood.

III. I read divers ſtories of women with child, who have luſted after, and have eat mens fleſh, and for that end have faln violently upon them, and bit them. This is alſo a diſeaſe proceeding of natural cauſes, as that infirmity of eating chalk, coals, dirt, tar, aſhes in maids, and ſome married women, called by Phyſitians, *Pica* or *Malacia*, and is cauſed by the diſtemper of the phantaſie, and ſoure malignant melancholy humors in the mouth and concavity of the ſtomach, and impacted in the tunicles of the ventricle, proceeding partly from the ſuppreſſion of the flowers, whereby the appetite is vitiated, and the phantaſie diſturbed; and partly from the malignity of the humor, coveting after ſuch things as are like to it in malignity, yet contrary to it in ſome of the prime qualities, heat, cold, humidity and ſiccity; for Nature looks in the contrary quality to finde remedy.

IV. I read of divers maids, one in *Colen*, another in the *Palatinate*, a third in the Dioceſſe of *Spira*, & divers more, who have lived without meat and drink two or three years together. This indeed may ſeem ſtrange, yet it is not againſt nature; for naturally ſuch bodies as have in them little heat, and much humidity, can ſubſiſt longer without food, then hot and dry bodies can; as we ſee in women and old people, who can faſt longer then men and youths. And we know, that divers creatures for many moneths together, can ſubſiſt without

food: therefore these maids having much adventitious moisture and little heat to waste the radical humidity, might continue a long time without food; for where there is little deperdition, there needs not much reparation: besides, the moisture of the air is no small help to them.

V. But that is more strange which *Zacutus* in his *Praxis Admiranda*, *lib.*1. *obs.*4. mentioneth of a Boy, who lived 3 years without a brain: if he had brought an example of one who had lived 3 years without an heart, I should have subscribed to *Galen* against *Aristotle*, that the heart in dignity is inferiour to the brain. But I suppose that he was not altogether without a brain: For that water which was found within the membrans of the skull, when his head was dissected, was doubtless his brain converted into water, or else it had some analogy with the brain, by which the heat of the heart was for a while tempered, and the animal spirits generated, but weakly, therefore life could not subsist long in him. So I have read in *Laurentius* or *Parry*, of one who lived many years without a spleen, but there were found some kirnels in the place of the spleene, which supplied its office. As for that woman mentioned by *Zacutus*, *Ob.*5. who lived eight years together with the half of a knife in her head, between the skull and *Dura Mater*, doubtlesse that knife touched not the substance of the brain, therefore could be no hindrance to the animal functions.

VI. It is strange, that whereas *Anacreon* was choaked with a Resin stone, yet some, as *Forestus* in his observat. recorderh, *l.*15. *obs.*24,25, *&c.* have swallowed iron, lead, long sticks, glasse, points of knives, and of swords, and other incredible things, without hurt, and have voided them by the stool. This I partly impute to the wideneſse and capacity of the passages; and partly to witchcraft, or juggling; for the eye in such cases is often deluded, although nature sometimes by impostbumes casteth out such stuffe; for points of knives, and pins, have been this way ejected: and some have perished, and have been choaked, whilest they have in their madnesse attempted such things. And provident nature hath in some without hurt sent away needles and pinnes by the urine, about which have been found hard crusty stuffe, which was the matter or glassy slime that was gathered about these pins, and baked by the heat of the body.

VII. I have read of a certain Soldier in the Wars of *Savoy*, *Anno Dom.*1589. who was shot in the forehead with a Musquet bullet, he was cured of the wound, but the bullet remained

ned: Afterward falling from a Ladder, whileſt he was ſcaling the walls of a Town, he was ſtiffled in the Ditch, into which he fell; his head being diſſected, the bullet was found in the hinder part thereof: But I believe this removal was by the fall; for otherwiſe it could not have been removed by the heat or ſpirits of the head.

CHAP. II.

Of one who wanted the pericardium. 2. *Of hairy hearts.* 3. *Of one that walked and fought after his heart was wounded.* 4. *Stones found in the heart.* 5. *And worms found there. The heart may putrifie, while we are alive.* 6. *Worms in the brain.*

Columbus in his Anatomy, *l.* 16. ſpeaks of a young man in *Rome*, whom he diſſected, and in this found that his heart had no Pericardium; the want of which, was doubtleſſe the cauſe of his death; and for want of it, he fell into divers ſwouning fits, and was often troubled with the Syncope, by reaſon the heart wanted refrigeration, which it hath from the water in the Pericardium. For ſome whoſe Pericardium hath beene but ſleightly touched by the ſword in the wound of the breaſt, have fallen into ſwouning fits, cold ſweats, with a ceſſation of the pulſe, ſo needful is this membran, and its water for the heart. Yea, I have read of ſome hearts quite dried & ſhrunk to nothing, for want of this water; ſuch was the heart of *Caſimire*, Marqueſs of *Brandenbourge*, of whom *Melanchon* ſpeaketh, *l.* 1. *de anima.*

II. I have read of divers hairy hearts, beſides thoſe of *Leonidas*, *Ariſtomenes*, and *Hermogines*, which is alſo the work of nature; for hairs are produced of fuliginous and groſſer excrements of the humours, where the skin is horreſt and drieſt, for hairs ſeldome grow where the skin is cold and moiſt; now if theſe cauſes be found in the heart, the ſame effect will be produced there; but this is ſeldome ſeen, and in ſuch onely as are of a fierce, truculent and audacious diſpoſition.

III. Ambroſe Parry ſpeaks, *l.* 9. *c.* 23. of a Gentleman, who in a duel being wounded deeply in the very ſubſtance of the heart, did notwithſtanding for a good while lay about him with his ſword, and walked two hundred paces before he fell down; this is likely enough, for though the heart was wounded, yet the vital blood and ſpirits, and heat of the heart, which

which did abound in him, did not presently spend, so long as they continued, he lived; when they failed, he fell down dead.

IV. What *Wierus* records in his work of Impostures, *l.* 4. *ca.* 16. concerning some stones found in the heart of *Maximilian* the second, is not incredible; for the same heat of the body that breeds stones in the bladder, kidney, and joynts, can also produce stones in the heart, if there be the same matter, and disposition for such a production, and this may be the work of nature alone, without sorcery.

V. Nor is it incredible, what is recorded by divers, of worms found in the heart; which cause consumptions, and strange distempers in our bodies, which oftentimes deceive Physitians: For the heart is no more priviledged from worms, then other members, save onely that its substance is hard and solid, and by reason of its spirits and heat, it is not so much subject to putrifaction, as parts more soft and loose, and consequently not so often infested with worms and imposthumes, as other members are; yet it is not altogether exempted. For I have read of one whose heart being opened, there was found in it a white worm with a sharp beck, which being placed on a table, and a circle of the juice of Garlick made about it, died, being overcome with that strong smell; by which it is plain, that the use of Garlick is wholesome and needful for such as are subject to worms, as being their destroyer.

VI. Fernelius is deceived, when he saith that the heart doth not putrifie in us whilest we are alive, because it is of a solid and hard substance, and is the last that dieth in us; but it is not more hard and solid, then the bones, which notwithstanding putrifie whilest we are alive; and it is true, that it is the last thing that dieth in us, for it doth not totally putrifie till we be dead, because all the heat, motions, and functions thereof cease not till then.

VII. And not onely in the heart, but in the braines also worms are ingendred, as *Avicenna*, *Hollerius*, and others doe witnesse. And I have read of black and round worms, that by sneezing powder of Castoreum and Pepper have been voided by the nose; and of ear-worms also.

CHAP.

CHAP. III.

1. *Epilepſie.* 2. *Incubus.* 3 *Vertigo.* 4. *Of a ſtone in the tongue.* 5. *One of nine years old brought to bed.* 6. *Bodies turned to Stones.* 7. *Sleep-walkers.* 8. *Superfetation. Ventriloques.* 9. *A ſtrange ſtone found in the matrix.*

THe Epilepſie and malignant feavers oftentimes end in deafneſs; and this is held a good ſigne of recovery; the reaſon is, becauſe nature thruſts out the malignant humor from the brain into the next paſſages, which are the ears.

II. Some take the night-mare or *Incubus* for a ſpirit, but indeed it is a feculent humor adhering to the virall parts, and with its black or melancholy fume troubling the Diaphragma, Lungs, and Brain, and diſtempering the imagination with horrid ſhapes.

III. Nature is very skilfull and provident in helping her ſelf when art faileth; for many diſeaſes have been cured by nature, which the Phyſitians have been forced to give off. *Zacutus Obſ.* 15. mentioneth one who being every month vexed with a terrible *Vertigo*, which for a time made him ſtupid and ſenſeleſs, was cured by a flux of blood guſhing out of his eyes, without any inflammation at all, or redneſs of the eyes; by thoſe veins that fed the eyes, nature found out a way to eaſe her ſelf, which veines were opened by the violent motion of the ſpirits in the head, and the abundance of blood preſſing into thoſe veins, which made an eruption.

IV. And it is no leſs ſtrange what he records, *Obſ.* 72. of one, upon the tip of whoſe tongue was found a ſtone as big as a filbert nut, which grew there within a ſwelling cauſed by a great flux, doubtleſs of ſlimy matter into that part, and baked into that conſiſtence by a preternatural heat; for he was much ſubject to Catharrs.

V. That is not incredible which is recorded by *Jaubert* in his *Vulgar Errors*, *l.*2.*c.*2. of young women, who have been brought to bed at nine or ten years of age, for nature is more pregnant and forward in ſome then in others; this we ſee in ſome trees, and other vegitables; but theſe women give off child-bearing betimes, to wit, about one or two and twenty: for, [*quod cito fit cito perit*] and as we ſay, ſoon ripe, ſoon rotten; for ſuch haſty and precipitate works of nature are not permanent: hence it is that women who ſooner attain to their growth

growth then men, decay ſooner then men.

VI. For ſtones to be bred in the Lungs, which are oftentimes the cauſes of drie coughs, is no great wonder, for divers times ſuch ſtones have been voided by coughing: but for a mans body to be converted into a ſtone, as is Recorded in the memorials of *Lyons* in *France*, is more ſtrange, yet not impoſſible, and therefore the converſion of *Lots* wife into a Salt Pillar is not incredible, although this was the ſole work of God. Neither is that incredible which is written of the lake that turns the ſticks caſt into it, into ſtones: nor that Cave in *Scotland*, where the water-drops are turned to ſtones; I have kept an apple til it grew to that hardneſs, that no wood could be harder, for ſcarce could a knife cut it. I wil not ſay this was a perfect ſtone into which this body was thus turned, but it might be as hard and drie as a ſtone; for the bodies that are found in the ſands of *Egypt*, are very dry and hard.

VII. *Horſtius*, and others record divers examples of ſleep-walkers, who do ſtrange things in their ſleep; but this is alſo the work of nature; for I finde that they are moſt ſubject to this infirmity, whoſe animal ſpirits are moſt active, ſubtil and fiery; and whoſe imagination is ſtrong; ſo that by the ſtrength of their fantaſie, and agility of their ſpirits, the muſcles are moved, though the Will doth not then concur to this motion, nor reaſon make any oppoſition, which it would do if they were naked, and not ſuffer them to undergo ſuch dangers.

VIII. I have read divers Stories of women who have had ſeaven children and more at a birth, and likewſe of ſuperfetation; both which are credible, and poſſible in nature, as I have ſhewed in the former book, *c. 13. ſect. 5. & 7.* But that the infant ſhould crie in the mothers womb, as ſome have done, is more ſtrange; ſeeing it doth not breath, neither is there any air in the matrix, without which there can be no ſound; therefore either this crie was imaginary in the party that heard it, for ſometimes we think we hear a ſound when we hear none; or elſe this ſound might proceed from wind in the mothers womb, which might reſemble the crying of a child, or elſe theſe mothers might be ventriloque.

IX. That may ſeem a miracle which is recorded by Monſieur *John Alibaux* a Phyſitian, of a woman of *Sens* in *Bourgundie* which went 28 years with a dead child in her womb; this woman being dead, and her belly opened, there was found a ſtone having all the limbs and proportion of a child of 9 months old. This was no miracle, but an extraordinary work of nature;

for

for the child being dead, and the ſlimie matter of its body having an aptitude by the extraordinary heat of the matrix to be hardned, might retain the ſame lineaments which it had before; If any wonder, how within the ſoft and liquid humors of the matrix, ſuch a hard ſubſtance ſhould be ingendred; let him as well wonder at the generation of hard bones within ſoft fleſh, of hard ſtones within ſoft plums, Peaches, and other fruits, of ſtones and hard thunder-bolts within watriſh clouds.

CHAP. IV.

1. *Some without Lungs.* 2. *Impoſtumes voided in Urine.* 3. *Worms the cauſe of many diſeaſes.* 4. *No change of ſexes.* 5. *Giants.* 6. *Some without livers.* 7. *Fleſhy bladders.* 8. *Stones, haires, worms, &c. Begot in our Urine.* 9. *A woman without a matrix.*

I Have read of divers bodies of men without lungs, and I believe it; for oftentimes the lungs are putrified and corroded with corrupt and acrimonious matter, and waſted with burning heat; but hence it will not follow, that a man can live without lungs any time, ſeeing the heart ſtands in need continually of refrigeration; yet ſome do live a great while with half of the lungs, after the other half is putrified and ſpit out.

II. I finde that when impoſtumations and corrupted matter in the breaſt cannot be evacuated by ſpitting, or coughing, or vomiting, or by Phlebotomy, or the ſtool, it is notwithſtanding purged out by urine, naturally, without the help of art; by which we ſee, how cunning and induſtrious nature is to help her ſelf, and that ſhe is more carefull to thruſt out noxious, then to draw in profitable things, hence ſick mens expiration is ſtronger then their inſpiration: and hence alſo we ſee that there are many porous and pervious paſſages unknown to us, which doubtleſs are in our bodies being alive, which cannot be found being dead, becauſe ſhut by the cold.

III. I finde that many Phyſitians are miſtaken in the cauſes of divers diſeaſes, and therefore their remedies prove oftentimes fruitleſs, or hurtfull: For I have known Apoplexies, Convulſions, Coughs, Conſumptions, Feavers, Cholicks, and other Diſeaſes proceed from Wormes, which when they have beene voided, either dead or alive, the

the ſick partys have recovered: Nay, I have read of ſome who have had worms crawle out at their navels: and ſome whoſe organs of voice and ſpeech having been aſſaulted and hurt by worms, have become ſpeechleſs; how carefull then ſhould we be of our diets, not to delight ſo much as we do in ſweet meats, ſauces, and drinks, or in ſuch food as breeds ſlimy matter, whereof worms are ingendred: and Phyſitians ſhould be as carefull to preſcribe ſuch things to their patients, as may kill and evacuate theſe enemies of our health and life.

IV. That maids have become boyes, I have read in divers Stories: but I have ſhewed in the former Book, that there is no ſuch change in nature, becauſe the organs of generation in the two ſexes, differ, both in number, form, and ſituation: and that therefore ſuch transformations are meant of Hermaphrodites, or of ſuch boyes, in whom the veſſels of generation have not at firſt appeared outwardly for want of heat and ſtrength, which afterwards have thruſt them out. Dr. *Brown* admits the change, and yet ſhews that the veſſels are different, both in form and ſituation, which is a contradiction.

V. That there have been Giants, and men of ſtupendious ſtature in all ages, is not to be doubted, ſeeing there are ſo many witneſſes extant: and the reaſon of their bigneſs can be none elſe, but the aboundance of ſeed and menſtruous blood of which they are begot, the quality and pliableneſs of the matter, apt to be extended, the ſtrength alſo of the heat and formative power: and that theſe men ſhould have rapacious ſtomachs to devour incredible quantities of meat and drink, is not to be wondred at, if we conſider the bulk of their bodies, the capacity of their ſtomachs, and rapacity of their heat.

VI. Nature is not deficient in neceſſaries, nor abundant in ſuperfluities, there is not any one member in our bodies that can be ſpared: for if there be any one defective, our life proves ſhort and miſerable. I have read of ſome who have been found without Livers, but ſuch had a fleſhy lump in ſtead thereof, which not being able to ſanguifie, or turn the Chylus into blood, the parties lived but a ſhort while, and died of Tympanies or Hydropſies; and others whoſe Livers have been found full of ſtones, have died of the ſame diſeaſe; and ſo have thoſe whoſe ſpleen hath been found ſtony. A woman who died of an Hydropſie, I ſaw diſſected, whoſe ſpleen was full of ſtones, of a blewiſh and green colour.

VII. Not onely are ſtones of great bigneſs bred in the bladder,

der, by which the paſſage of the urine is intercepted, and ſo death and many tortures are procured; but alſo there have been found in ſome bladders, great lumps of fleſh, yea all the internal ſide of the bladder filled up with fleſhy excreſcences, that there could be no room for the urine; but I doubt whether this were true fleſh or not, ſeeing no fleſh is begot but of blood; I think therefore that this was an excrementitious ſubſtance reſembling fleſh in colour and ſhape.

VIII. It is manifeſt that ſome with their urine evacuate ſtones, gravel, matter, hairs, little crawling creatures of divers ſhapes, which doubtleſs are begotten of putrifaction, according to the diſpoſition of the matter, and heat of the bladder, or kidneys; if the matter be aduſt and burned, hairs are begot ſometimes as big as hogs briſles: and ſometimes the ſtones of the kidneys are ſo big that they ſtick in the yard, and cannot be evacuated without inciſion; upon the ſtoppage of the urine by theſe ſtones, malignant vapours aſcend from the corrupted urine into the noble parts, that convulſions, ſyncopes, and other dangerous effects are procreated.

IX. As a man can live without teſticles, ſo can a woman, without the matrix, theſe being members given by nature not for converſation of the individuals, but for continuation of the ſpecies: Therefore *Zacutus* ſpeaks of a woman who lived thirty years after her matrix was cut out; which by a fall that ſhe had from a high tree, had ſlipt out of its place, and could never be again replaced. *Obſ.* 76. *l.* 2.

CHAP. V.

1. *Strange but not miraculous births.* 2. *Strange and ſtrong imaginations.* 3. *Poiſon inward and outward.* 4. *Poiſon of mad Dogs.* 5. *Cantharides.* 6. *Poiſon how it worketh.* 7. *Why birds not poiſoned as men.* 8. *Amphiam, Opium, Mandrakes.* 9. *The Plague no Hectick nor putrid Fever.* 10. *Epidemical diſeaſes.*

THat a boy of nine years old ſhould beget a child, is rare, but much more ſtrange it is that a child ſhould be born with all his teeth, and another with a long beard, yet ſuch have been: and theſe are but the effects of nature, which though in her ordinary courſe ſhe obſerves a time for the growth, perfection, and decay of things: yet ſometimes ſhe is furthered and hindred, according as the matter is diſpoſed, the

the heat proportioned, and her inſtruments fitted : Why ſhould not Nature have the ſame priviledge that Art hath; but we ſee that hearbs and fruits can be produced and perfected before their time, by the Art of man, therefore ſuch works are meerly natural, not miraculous: for ſublunary bodies are not like the celeſtial, which are not ſubject to alteration, but ſtill keep the ſame conſtant tenor.

II. What force the imagination hath in women, to make impreſſions of the things imagined on the tender infant in the womb, is known by many Stories, and daily Examples : Hence it is that ſo many children are born with ſuch variety of ſtrange ſhapes and marks. Beſides, we know how forcible the phantaſie is, both in curing and procuring of diſeaſes; yea, oftentimes of death. Thus one having eat of a Rabbit pie, imagining ſhe had eat of a cat, fel a vomiting and died. Another having paſſed over a dangerous bridg in the dark, and returning the next day to look upon the place, was ſtruck with ſuch an horror, that he went home and died. A third being in jeſt made believe that he muſt loſe his head, ſwouned and fel down dead. Multitudes of ſuch Examples there are; but the imaginations which proceed from hypochondriacal melancholy, are moſt ſtrange, whereby one ſuppoſeth himſelf to be dead, therefore will not eat. Another is perſwaded that he hath never a head. A third, that his breech is made of glaſs, therefore will not ſit down for fear of breaking. Another thinks the heaven will fall upon him, therefore muſt have a Target born over him. Another wil not piſs for fear he ſhould drown the world : And many more ſuch ſtrange conceits are ſome men troubled with by reaſon of their imaginations which are diſtorted by the black and malignant fumes that diſturb the animal ſpirits, ſubſervient to the phantaſie. Such are the imaginations of thoſe who think themſelves wolves, and therefore run into the woods, and bite men and cattel they meet with. I have read of one who thought himſelf to be a cock, and therefore fel to crowing. And doubtleſs the Lycanthropie ſo much ſpoken of, is nothing elſe but the ſtrength of a diſtemper'd imagination, whatſoe'r *Bodin* writes to the contrary.

III. The cauſe of many extraordinary diſtempers in us, is poyſon, whether internal, bred within our ſelves by the corruption or putrefaction of the ſeed, blood, or humors of our bodies, by which peſtilent and venemous fumes aſſault the heart and brains : or external, as the biting of mad dogs, or cats, or other creatures : For I have read of ſome that never were bitten, and yet have beene ſubject to the ſame kinde of raging and

fury

fury that they are who are bit by mad dogs; but their fits were milder, because the constitution of dogs is more melancholy then that of mans, therefore their venom more dangerous; and who would think there were such poyson in a mad cock, who being angred, struck one in the hand with his beck, upon which blow the man fell distracted and died, neither could any physick cure him.

IV. The madness that is caused by the biting of mad dogs, is not in all men alike, but upon some the poyson worketh sooner, upon some later, according to the degree of madness in the dog, or the deepness of the wound, or disposition of the body wounded: for foul bodies, melancholick and cholerick constitutions are aptest to receive the venom; therefore in some the poyson appeareth quickly, in others not in a long time, to wit, not in a year, or more; for the malignity doth not presently assault the spirits, heart and brains. And *Capivaccius* observes, that this poyson is of a fiery quality, and hot in the fourth degree, as he sheweth by one who was thus bit; his body being opened, there was found no water in his *Pericardium*, but a part of it was burned up, and being touched, fell into ashes; the ventricles also were dried up, and had no blood at all.

V. It is strange that some do piss blood upon the applying of the Flyes called Cantharides to the neck, hands, or feet, so remote from the bladder: by this we see that the malignant vertue of these flies, hath a particular influence upon that member. This action of the bladder cannot be by the first or second qualities of the Cantharides: for then they should work first upon the next members: therefore this action must be performed by an occult quality, of the specifical form of the flie. And much more strange is it, that the body of this flie should be poyson, and the wings thereof a counterpoyson, which in the living fly are at concord, by reason of the specifical form or soul of the fly ruling all the parts, and keeping them in unity; but when that is gon in the dead fly, the one part destroys the other. Who can give exact reasons of Natures secrets?

VI. And no less strange is it, that Euphorbium and Mustard are equally hot, to wit, in the fourth degree, and yet the one is poyson, not the other; and Treacle which is hot in the first degree, heats more then Pepper which is hot in the fourth degree; this shews that the form of the one is not so active as the form of the other; and therefore four times so much heat in

the one, is not ſo prevalent as one degree of heat in the other; which ſhewes that poyſons do not work by their temper which conſiſt of elementary qualities, but by their ſubſtance or form, whoſe qualities are occult to us.

VII. Why *Napelius*, or Wolfe-bane, *Hyoſciamus*, or Henbane, and other hearbs which are poyſon to man, are nutriment to birds, can have no other reaſon, but that birds have a greater heat in their ſtomachs to ſubdue the malignity of theſe hearbs to ſend away the noxious and excrementitious part, and to convert the reſt into their own ſubſtance, which ſubſtance notwithſtanding is not poyſonable to man, becauſe the poyſon was conſumed by the heat of the bird. Now the heat of mans ſtomack is more temperate, and therefore leſs able to maſter ſuch malignant hearbs; yet *Scaliger* (*Exerc.* 175. 1.) ſpeaks of a man who was fed with poyſon from his infancy, whoſe fleſh at laſt became ſo venomous, that the flies which ſucked his blood ſwelled and died.

VIII. That *Amphiam*, or *Opium*, ſhould ſtir up venery, and cauſe a tickling in the skin, and yet ſtupifie the members, and caſt them into a dead ſleep, is not without admiration; but doubtleſs either the *Amphiam*, or *Opium*, are different, that being made of the white, this of the black Poppies, or elſe in the *Opium* there be different ſubſtances, the one being very cold, which cauſeth ſtupidity; the other very hot, by cauſing a tickling in the skin: which heat is alſo perceived by its bitterneſs; but cold is moſt predominant, or elſe we may ſay that it excites venery accidentally, by temperating the exceſſive heat of the body, which is an enemy to *Venus*: The like effect is wrought by Mandrakes, which perhaps was the cauſe that *Rachel* ſo much defired them. Nor muſt we think it ſtrange that the *Opium* produceth contrary effects; for we know that the ſame Roſe in ſome part of it hath a ſtiptick, in other parts a laxative quality.

IX. The plague to which our bodies are ſubject, is an occult poyſon, killing us by the breath or touch, and not an Hectick Feaver, becauſe this drieth and burneth up the heart by degrees, the plague kils ſuddenly. 2. The Hectick is not infectious, as this. 3. In a confirmed Hectick there is no recovery, in the Plague divers recover: nor is the peſtilence a putrid Feaver, becauſe, 1. the pulſe is more remiſs, the urine clearer, the head-ach, thirſt, and agitation of the body leſs in the plague then in a putrid Feaver. 2. Becauſe a peſtilential feaver followes upon a p[illegible] when this is gon, that begins.

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X. Epidemical diseases, whereof pestilential are the most pernitious, are conveyed to us by the air, which we are continually attracting to the heart and brains, 1. either when the air is infected with the impression of malignant and occult qualities from the influence of the Stars, or, 2. when it is poysoned with putrified, corrupt, and pernitious vapours exhaled out of pits, caves, ditches, putrified lakes, *&c.* Or, 3. When the prime qualities of the air, to wit, heat, cold, *&c.* are intensive beyond ordinary; but we must not think that the substance of the air is at any time putrified: for being a simple body, it is not subject to putrifaction.

CHAP. VI.

1. *Antipathies to some meats.* 2. *The force of Fear.* 3. *Blood voided by the Gums and Navil.* 4. *Black hairs suddenly gray.* 5. *Violence of passions.* 6. *Defects in nature recompensed.* 7. *A Fly voided by Urine.* 8. *Monethly bloud in men.* 9. *The causes of Monsters.* 10. *Horns on mens heads and heels.*

AS there are divers temperaments of men, so there are divers sympathies and antipathies to certain meats and drinks: some cannot indure the sight or smel of Cheese, others abhor eggs, others flesh, others bread, some cannot abide wine, others abhor piggs, and all kinde of swines flesh, many cannot endure the smel of apples, others detest all kind of sweet meats; and which is most strange, that the smel of Roses so pleasing to most men, is odious and deadly to others. Cardinal *Caraffa* during the time of Roses, used to inclose himself in a Chamber, not permitting any to come near him that had Roses, as *Wierus Valerian* shews in his Hieroglyphicks, the smell of a Rose would cause a certain Jacobin swoun, and be like a dead man, as *Amatus Lusitanus* recordeth in his second Centurie; the like is written of divers others. This must either proceed from an occult quality, or from the distemper of the phantasie and prejudicate opinion that some have of such things, that they are hurtful to them; or else it is in some an hereditary infirmity proceeding from the parents: for *Forestus* writes, that in a certain family the sons could not eat Cheese, but the daughters could eat it with a good appetite, because

the mother did love Cheese, but the father could not abide it: See his Annotations on the fifth Observation, *lib.* 4.

II. Fear is more powerfull in curing of diseases, then any Physitians in the world: for *Zacutus l.*2. *Obs.* 86. speaks of a woman whose matrix had fallen, and hung out of its place two years together, neither could any Physick or Art replace it again, till a sudden fear attracted it, she feeling the mice running up her thighes, which she had purposely (holding them by a thread) let run towards the part; the matrix suddenly slipt into its own place again.

III. Nature is more skilfull then any Physitian to cure her self; and if she cannot finde a way for evacuation of her superfluities, she will with *Hannibal* make a way, though it be through Rocks: for he shewes that the ordinary passage of the menstruous blood being stopped in a certain woman, Nature made her a passage through the gums, out of which monthly for two days together great store of blood was voided. He speaks of another who on the like occasion had a vent for the blood through the navel, *lib.*2.*Obs.*91,92.

IV. That black hairs should become suddenly white, may to some seem incredible; yet we have stories of this sudden change. *Scaliger* (*Exercit.*212.) tells us of one *Francis Gonzaga*, who being imprisoned upon suspition of treason, in one night his black hair turned white. *Vives* in his Preface on *Scipio's* Dream, and *Hadrian Junius* in *Comment.de Coma.c.*10. speaks of a young Spanish Gentleman, who in a night became as white as one of 80 years old, *Cælius Rodiginus* in his 13 Book *Antiq. lect.* speaks of another who searched after young Hawkes upon a high steep Rock, and fearing the rope would break with which he was held, became instantly white. Divers other examples I could alledg, but these are sufficient to let us see that the change of our hairs which is perform'd by nature in space of time ordinarily, is upon an extraordinary fear effected suddenly in some; the roots of the hairs being deprived of that heat and radical moisture between the flesh and skin of the head, by which they were fed, the spirits and blood flying suddenly to the heart, leave the other parts destitute. This we see in trees, when blasted with a piercing cold wind, their leaves suddenly change colour, and of green become yellow, their naturall heat and moysture being extinguished and dried up.

V. There is no passion in our bodies more violent then fear, which distempers the fantasie, troubles the other sen-

ses,

ſes, cauſeth our hairs to ſtand an end, makes us dumb; all which the Prince of Poets expreſſed in one verſe: *Obſtupui, ſteteruntq; comæ, & vox faucibus hæſit*; and indeed the fear of death, hath upon ſome brought ſudden death: the ſpirits, heat, and blood, flying ſuddenly to the heart, by which this is oppreſſed, and the ſenſes left deſtitute. Others by ſudden fear have loſt their judgement, and become diſtracted; ſtrange effects alſo are produced in us by exceſſive anger, and joy; ſo that ſome have ſuddenly died, with immediate anger, and exceſſive joy, the ſpirits and heat flying ſuddenly from the heart, into the exterior parts, by which means ſyncopes, ſwoundings, and death follow: As I could inſtance in many examples.

VI. I obſerve that where Nature is defective in one part, there is a recompence made; for they who are born blind, exceed us in memory; and they who are born deaf and dumb, excell us in apprehenſion; they who are born without hands or arms, perform with their feet, what we do by our hands. *Phil. Camerarius* in his Hiſtorical meditations, c. 37. ſpeaks of one who could make pens and write with his toes, cut, carve, and feed himſelf, as well as we with our hands, but his toes were longer then ordinary, and proportioned like our fingers: *Montague* in his Eſſays, *l.* 1. *c.* 22. writes of another, who with his toes could diſcharge a Piſtol, take off his hat, play at cards and dice, and handle his ſword as well as we with our hands, by which we ſee how cuſtom becomes another nature.

VII. Though it be rare, yet it is natural for a fly to be ingendred in mans body, the mater being diſpoſed to receive that form; for *Zacutus, Obſe.* 101. writes of one who being pained in his yard, at laſt voided a fly by his urine.

VIII. As there be ſome maſculin women, ſo there are ſome feminate men; ſuch was he who from twenty to forty five, had his monthly vacuation of blood, as women have; by which it ſeems his conſtitution was altogether feminine, moiſt and cold; therefore was ſmooth skinned, having no Beard, nor hair at all on his body. *Zacut. Obſ.* 102. *l.* 2. *prax. mir.*

IX. Of the many mouſtrnous ſhapes which are begot of women, We may read in *Winrichius, Parrie, Rumelinus, Levinus, Lemnius*, and divers other Phyſitians, Phyloſophers and Hiſtorians, whoſe Teſtimonies and Examples I alledge not, becauſe I would be brief: the

cauſe of theſe Monſters cannot be the mothers imagination, as moſt think; for the imagination makes not impreſſion on the Embryo, but of ſuch things as the mother earneſtly deſires; as ſhe that luſted earneſtly for a roſe, which having with much difficulty got;(for it was not roſe time) ſhe greedily ſmelled to it, and laid it up in her boſome; upon which, the impreſſion of a roſe was made in the childs skin. But what mother will luſt to have a child with a dogs head, or of any other monſtruous ſhape, ſeeing they abhor ſuch conceptions? Therefore ſuch monſtruous ſhapes are the effects of the formative faculty in the ſeed,which if it be peccant either in quantity or quality, or if there be any fault in the place of conception, or in the menſtruous blood of the mother, then the formative aiming at the ſpecifical ſhape, but miſſing of it by reaſon of theſe impediments, rather then it ſhould be idle, and do nothing, it brings in the generical form of an animal, either perfect or imperfect, as the matter is diſpoſed; though I denie not the influence of the heavens; but this is only a remote and univerſal cauſe.

X. I have read of one who had a horn grew upon his heel a foot long, which being cut off, did grow again; and doubtleſs would have ſtill renued,if the tough and viſcous matter which fed it, had not been diverted and evacuated by iſſues, purges, and phlebotomy; for when Nature hath found a paſſage for evacuation, thither ſhe ſends the ſuperfluities. But more ſtrange it is that children ſhould be born with horns on their heads. Of ſuch I have read. *Hildanus* writes that he ſaw a man on whoſe head grew a horn, crooked like a rams horn; in his Chirurgical obſervations *Cent.*2.*Obſ.*25. The ſtory therefore of *Jupiter Amon*, may not be incredible.

CHAP. VII.

1. *The effects of blood being drunk.* 2. *Some ſtrange diſeaſes.* 3. *Plica Polonica.* 4. *Some eat poiſon without hurt.* 5. *Stones in the Inteſtines.* 6. *Old men become young.* 7. *Some ſtrange monſters.*

I Have read of one who was poyſoned with drinking bulls blood; of another who grew mad by drinking of mans blood, of a third who by drinking of his wifes monthly blood, was ſo enamoured with his own wife, that he hated in reſpect of her, all other women;ſome from hence have concluded, that there is poyſon in theſe creatures blood; but I am not of their minde;

minde; for doubtleſſe if the fleſh of theſe creatures be ſound and wholeſome, the blood out of which the fleſh is made, cannot be venomous. 2. The blood of a Bull is groſſe, fibrous, ſtopping, and hard of concoction, and ſo to weak ſtomacks may prove accidentally hurtful or deadly, but not to a ſtrong ſtomack. 3. It may kill even a ſtrong body, if it be taken in too great a quantity, and ſo may any meat, and the beſt wines in this reſpect prove poiſonable. 4. If mans blood were poiſonable, then *Catalin* and his companions had been poiſoned, when they dranke mans blood at the taking of their ſolemne Covenant againſt the State, as *Saluſt* ſhews. Then *Polyphemus* had been poiſoned by *Uliſſe*'s fellows, *Dum viſceribus miſerorum & ſanguine veſcitur atro.* What will become of the Canibals? 5. The menſtruous blood of women, is as ſound as any other blood in the veins, if the body be ſound: but if it be imperfect or corrupted with malignant humours, it may be poiſonable; but I deny, that there is any ſuch vertue in blood, as to procure love; this may be an illuſion of Satan, who delights in blood.

II. Strange are the diſeaſes that ſome bodies are ſubject too; I have heard of one who being troubled with a burning feaver, had his veins opened, out of which with the blood there ſlipt out a worm of a foot long: another had a red ſpot, which did riſe in his foot the bredth and colour of a red roſe, which did now and then remove from one place to another; and in what place ſoever it was, cauſed an intolerable burning, which could be nothing elſ but a ſcalding blood carried up and down by hot and fiery ſpirits; of theſe two *Zacutus* ſpeaks, *l.* 3. and of a third whoſe skin grew as hard and rugged as the bark of a Tree.

III. Some uncouth and ſtrange diſeaſes have appeared in this latter age of the world, not heard of heretofore; one is mentioned by *Rodoric. Fonſeca, conſ.* 1. in his conſultations, called *Plica Polonica*, becauſe in *Poland* it rageth moſt; this diſeaſ ſuddenly weakneth the body, curleth the hairs of the head, and intangleth them ſo, that they repreſent the ſhape of ſnakes, and being pricked drop with blood, and ſwarm with lice, and make a loathſome ſmell. This diſeaſe proceeds doubtleſs from the corruption of the aire, the groſſeneſs of the diet, their frequenting of cloſe ſtoves, the infection of the blood, and the abundance of viſcous humours, and groſſe vapours which nature ſends to the skin of the head, and to the hairs. I will not ſpeak here of the Scurvy, the French diſeaſe, the Engliſh

ſweat, and others too well known among us.

IV. Strange is the variety of tempers and conſtitutions among men; *Arnoldus de villa nova in ſpecula, c.* 77, ſpeaks of a maid who familiarly did eat ſpiders, which ſheweth, that either ſpiders are not venomous, or elſe her body was of the ſame temper that Monkies are, who eat ſpiders. But that is more ſtrange which is mentioned by *Galen, l.*3.*c.*18. *Simpl.* Of an old woman that ate Henbane plentifully, without hurt; it ſeems ſhe had the ſtomach of ſwallows, which feed upon this poiſonable weed. I have read of ſome that have eaten Scammony, others Opium, others Hellebor, and of ſome that without hurt have ſwallowed quick-ſilver; that muſt be attributed to their particular tempers, and ſtrength of heat by which they maſtered theſe poiſons.

V. As ſtones are ingendred in the kidneys, bladder, and other parts, ſo are they alſo ſometimes bred in our inteſtins, for there are ſome that void ſtones familiarly by the ſtool: and I have read of one who was killed by a ſtone that grew & ſtuck faſt to his colon, the bigneſſe of a chef-nut; this ſure muſt proceed from the extraordinary heat of the inteſtins, and viſcous matter impacted there; for the heat baked the matter to the conſiſtence and hardneſſe of a ſtone, by drying up the watriſh moiſture thereof.

VI. I have read of ſome old men and women, that have becom young again: that is to ſay, after they had loſt their teeth, ſtrength, and beauty, have recovered all at 80 or 100 years of age; their veins filled with blood, new teeth, a freſh colour, their white haires turned black, and in women their monethly flowers freſh and orderly. This is not unlikely; for if after a fever, or other great ſickneſſe, nature recovers her loſt beauty, vigour, colour, and decayed ſpirits and ſenſes, why may not ſhe doe the like in ſome people, ſeeing there is not in old age, a total privation of theſe perfections there, but a decay; and we may obſerve, that many who are old, weak and ſickly, when they are young, are young, luſty, and healthy, when they grow old.

VII. I have read of men that have had milk in their breſts, which is likely, if they were of a cold, moiſt, and feminine complexion, abounding in blood; of women alſo who have had four breaſts, all full of milk: which is probable, ſeeing there be many monſters, that have ſuperfluous members, according to the ſuperabundance of the parents ſeed and prolifical blood; but of all monſters, that which is mentioned by *Buchanan*

chanan in his Hiſtory of *Scotland*, is moſt wonderful, which had beneath the navel, one body, but above two bodies; when it was hurt beneath the navel, both bodies felt the pain; if hurt above, the body felt only that was hurt: Theſe two would ſometimes differ in opinions and quarrel, the one dying before the other; this pined away by degrees, it lived 28 years, could ſpeak divers languages, and were by the Kings command taught Muſick. Doubtleſſe nature aimed at twins, but failed in the lower part. Neither was this one *Individuum*, but two, becauſe they were two ſouls, as appears by their different wills; and it is the form, not the matter that is the cauſe of individuation.

CHAP. VIII.

1. *Of divers and ſtrange ſpleens.* 2. *Black urine.* 3. *One lived without ſleep.* 4. *The Tarentula's effects and cure. The force of Muſick.* 5. *Serpents begot of dead brains.* 6. *Of Tiberius his ſight, Alexanders ſweat. Strabo's eyes.*

FAllopius in his Anatomical Obſervations, (*l.* 1. 6.) writes, that he hath found three Spleens in one man, *Gemma* in his *Coſmocritick* ſpeaks of two Spleens that he found; and hee writes of one who had the Spleen in the right ſide, and the Liver in the left, in *l.* 1. *Cyclognomonick*, *p.* 75. Some have Spleens of incredible bigneſſe and weight: others have them faſtned to their breaſts: others looſe and ſwimming up and down: others again have had no Spleen at all, and ſuch have died of the black jaundice: for the blood and skin could not but bee infected with that melancholy humour, wanting the Spleen, which is the proper receptacle of it.

II. For a man in a burning fever, or one that is oppreſſed with melancholy humours, to void black urine, is no wonder; but for one that is found all the days of his life, to piſſe black urine, as *Petræus* ſheweth, is ſomewhat ſtrange, *Diſput.* 5. *de urinis*, *num.* 22. But doubtleſs the conſtitution of that man was melancholick: for the black colour in any thing, is cauſed by the predominancy of earth: therefore *ater quaſi à terra:* And earth is moſt predominant in melancholick tempers; beſides, the watrineſſe of natural heat may be the cauſe of black Urine.

III. Whereas the animal ſpirits and ſtrength of our bodies are waſted by watching; therefore ſleep is ordained to

to repair and refresh the decayed strength and spirits. Yet *Fernelius* (in his *Pathology*, *lib.* 5. *c.* 2.) speaks of one who lived without sleep 14 moneths. But this man was possessed with madnesse, whose brain being heated with adust melancholy, did beget animal spirits without much wasting of them. Thus we see that hot and cholerick constitutions can endure longer without sleep, then cold and moist complexions.

IV. The effects of the *Tarentula* in mens bodies are strange and various, and no lesse strange is the cure: for their sting and poison cause some to laugh, some to weep, some drowsie and stupid, and some jovial and merry: These divers effects must proceed from the diversities of poison that is in them: for it seems these venomous creatures are not all of one kind; or else these doe proceed from the different constitutions and tempers of those men that are stung with them: Thus we see what different effects drunkennesse doth cause in men, and so doth musick; but whether this poisonable humour be cured by the musick, or by their dancing, and labour, by which the pores are opened, and the poison by sweat expelled, is questionable; but I think by both; for even in musick, there is great power over the minde and affections, and consequently over the diseases and humours, which are mitigated or exasperated according to the minde and affections. This we see in *Sauls* melancholy, which was cured by *Davids* Harp. Such force there was in *Timothy* the *Milesian*, that when he pleased he could by the power of his musick, make *Alexander* take up and lay downe Arms. Not to speak of that *Dane*, who by his musick could make men mild, sad, and merry at his pleasure.

V. That a Serpent should bee ingendred of a dead mans brain, is no more impossible then for Snakes or Eels to be begot of Horse hairs; or for divers sorts of beasts to breed in women upon depraved conceptions. And doubtlesse as Satan in the form of a Serpent, brought mortality upon mankind, so he doth sometimes triumph in that shape over mans mortality; God in his judgement permitting sometimes that dead brain to be turned into a Serpent, which when it was alive, did hatch so many Serpentine plots and imaginations.

VI. I read in *Suetonius*, that *Tiberius* the Emperour could see perfectly in the dark. And *Curtius* writes, that *Alexander* did smell sweetly when he sweat. I have read of men and women who can fascinate and hurt others with their eyes. *Pliny* and *Solinus* write of one *Strabo*, who from a Promontory in *Sicily*, could see the ships that went out of the Harbour at *Carthage*,

thage, which is 55 Leagues. These are strange and rare priviledges, in which God doth manifest his power, and sheweth, that he is not tied to the Laws of nature. Yet there is no necessity, that we should call these miracles: for as it is no miracle for a Cat to see in the dark, nor for a musk-Cats sweat to smell sweetly, nor for a Basilisk to kill with his eye, or rather with the poisonsome vapour of his eye or breath of his mouth; nor is it a miracle for an Eagle or Raven to see at such a distance; these effects flowing from the natural temper and constitution of these creatures, of which temper might these men now mentioned be. I could alledge many other strange qualities of men, as of one who could move his ears like an Horse, of another whose spittle was poison, and of one who never laughed, &c. but these are sufficient to let us see the power and wisdome of God, and the dexterity of his Handmaid Nature, both in the fabrick and divers temperaments of mens bodies.

FINIS.

The Second BOOK.

Of the ſtrange Diſeaſes and Accidents of MANS BODY;

Wherein divers of Dr. *Browns* vulgar errors and aſſertions are refuted, and the ancient Tenents maintained:

CHAP. I.

1. *Divers ways to reſiſt burning.* 2. *Locuſt eaters, the lowſie diſeaſe, the Baptiſt fed not on Locuſts.* 3. *Mans fleſh moſt ſubject to putrifaction, and the cauſes thereof; How putrifaction is reſiſted. Mumia.* 4. *The ſtrength of affection and imagination in dying men. Strange preſages of death.* 5. *Difference of dead mens ſkuls, and why.*

THAT ſome mens bodies have endured the fire without pain and burning, is not more ſtrange then true; which may be done three manner of ways: 1. By divine power, as the bodies of *Shadrach*, *Meſhech*, and *Abednego*, received no hurt or detriment in the fiery furnace. 2. By a Diabolick skill; ſo the Idolatrous Prieſts among the *Gentiles*, uſed in ſome ſolemn ſacrifices to walk ſecurely upon burning coals, as the Prince of Poets ſhews. *Æn. lib.* 11.

——Medium fieti pietate per ignem,
Cultores multa premimus veſtigia pruna.

And as the men in the Sacrifices of *Apollo*, ſo women in the Sacrifices of *Diana*, uſed to walk upon burning coals, as *Strabo* witneſſeth, *lib.* 12. Of this cuſtome *Horace* alſo ſpeaks, (*Hor.* 1. *Od.* 1. *Incedis per ignes ſuppoſitos cineri doloſo.* So *Propertius*

[*Pro.*

[*Pro. El.* 5. *l.* 1.] *Et miſer ignotos veſtigia ferre per ignes.* And ſo it was uſed as a Proverb, ἀνθρακιὰν ἐπιβαίνειν, to walk upon coals when a man undertook any dangerous buſineſſe. The Scripture alſo ſheweth, that the *Gentiles* uſed to make their ſons and daughters paſſe through the fire: They uſed alſo in ſwearing, to take a burning Iron in their hands without hurt, as *Deliro* ſheweth in his Magick. *Pliny* and *Sueton* write, that *Pyrrhus* his thumb, and *Germanicus* his heart, could not be burned. 3. The body is made ſometimes to reſiſt fire by natural means, as by unguents; ſo thoſe *Hirpiæ*, or *Hirpini* in *Italy*, of whom *Pliny*, *Varro*, and others make mention, uſed to anoint the ſoles of their feet with this unguent, that they might walk on the fire. *Busbequius* [*Epiſt.* 4.] was an eye-witneſſe at *Conſtantinople*, of what was done in this kind by a Turkiſh Monk, who after dinner took an hot burning iron out of the fire, held it in his hand, and thruſt it in his mouth, ſo that his ſpittle did hiſſe, without any hurt; whereas one of *Busbequius* his men, thinking this Monk had onely deluded the eye, takes the ſame iron in his hand, which ſo burned his palm and fingers, that he could not be healed again in many days. This was done by the Monk, ſaith *Busbequius*, after he had put ſome thing in his mouth when he went forth into the Court, pretending it was to ſeek a ſtone. The ſame Authour witneſſeth, that he ſaw at *Venice* one who waſhed his hands in ſcalding lead; and why may not the body be made to reſiſt the fire, as well as that kind of *Linum*, called therefore *Asbetinum*, by the Greeks, and *Linum vivum* by the Latines, [*Pancerol. de Lin. vivo.*] in which they uſed to wrap their Emperours bodies when they buried them, that their aſhes might not be mingled with the aſhes of their fire; this *Linum* being incombuſtible. The Salamander alſo liveth ſometime in the fire, though not ſo long as ſome have thought. [*Pyrauſtæ* are gendred in the fire; So *Ariſtotle* and *Scaliger*.] Nor muſt we think it fabulous (as Dr. *Brown* too magiſterially concludes, *Of Errors*, 7. *Book c.* 18.) What is written of the *Spartan* Lad, and of *Scævola*, the Roman, who burned their hands without ſhrinking; he doubts of the truth of this, and yet makes no doubt of that which is more unlikely, to wit, of Saint *Johns* being in the Chaldron of ſcalding oyl without any hurt at all. [*Book* 7. *c.* 10.] he that will queſtion the truth of *Scævola*'s burning his hand, and of *Curtius*, leaping into the burning gulf, may as well queſtion the broiling of Saint *Lawrence* on the Grediron, or the ſinging and rejoycing of other Martyrs in the midſt of their flames.

II. That

II. That in *Ethiopia* there is a people whose sole food are locusts, is witnessed by *Diodorus* and *Strabo*, [*l.* 4. *c.* 16.] these from their food are called *Acridophagi*; they are a lean people, shorter and blacker then others; they are short lived, for the longest life among them exceedeth not 40 years: Their Countrey affordeth neither fish nor flesh, but God provides them locusts every Spring, which in multituds are carried to to them from the Desart by the West and South-west winds: these they take and salt for their use. These wretched people die all of one disease, much like our lousie sickness: A little before their death, their bodies grow scabby and itchy, so that with scratching, bloody matter and ugly lice of divers shapes, with wings, swarm out of their belly first, then from other parts, so that they pine away and die in great pain. This disease doubtless proceeds partly from the corruption of the aire, and partly from the unwholesomness of their diet, which turns to putrid humours in their bodies, whence the disease is Epidemical. This vermin breeds most in those who are given to swear, to nastiness, and abound with putrified humours, between the flesh and skin, whose constitutions are hot & moist, as children; and according as either of the four humours are predominant, so is the colour of lice, some being red, some white, some brown, some black; sometimes they burst out of all parts of the body, as in *Herod*, and in that *Portugal*, of whom *Foreſtus* speaks [*l.* 4. *de vitiis capitis*] out of whose body they swarmed so fast, that his two men did nothing else but sweep them off, so that they carried out whole baskets full. Sometimes they breed but in some parts onely, as in the head or arm-pits. *Zacuta* mentioneth one who was troubled nowhere but in his eie-lids, out of which they swarmed in great numbers. Some have voided them by boils and imposthumes. *Foreſtus* speaks of one who had them only in his back, whom he advised to hold his naked back so close to the fire, till it blistred, out of which blisters they came, and so he was cured. Salt is an enemy to them, yet they are bred in those *Æthiopians* by the frequent eating of the salt locusts: But perhaps it is not the eating of the salt meat so much, as the nastiness, and sweat, unwholesom waters, and corrupted air that breeds them. And it is certain, that wild and savage people are most given to them, because of their careless uncleanliness, using no other remedy against them, but shirts died with Saffron, which some wilde *Irish* doe wear six months together without shifting. But sometimes this disease is inflicted by the immediate hand of God, as a punishment of sinne

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and tyranny. Examples we have in *Sylla*, *Pherecides*, *Herod*, *Philip* the ſecond of *Spain*, and others who died of this malady. Now becauſe Locuſts are ſuch an unwholeſome food, I cannot think that *John Baptiſt* did feed on them; and therefore it is no vulgar error, to hold, that ἀκρίδες in *Matth.* 3. doth ſignifie the tops of hearbs rather then locuſts, both becauſe theſe were an unwholeſome food, and unpleaſant to the palat and noſe, uſed rather for Phyſick then diet, as *Dioſcorides* and *Galen* ſhew, that Locuſts are good againſt the Cholick and Stone, and may be more ſafely given then Cantharides to provoke urine. And although the *Æthiopians* did eat them for food, yet this is no argument to prove, that *John* did eat them; which is all the reaſon that *Beza* and *Caſaubon* bring to prove their aſſertion: neither can it be proved, that Locuſts were a food ever uſed in *Judæa*: For *Peluſiota*, who lived an Eremite many years in thoſe Deſarts, never knew any ſuch food uſed there. But whereas they alledge, that in *Levit.* [*c.* 11. *v.* 22.] Locuſts are ſet down for clean food: I anſwer with *Munſter* [*on Levit.* 11. 22. who though an excellent Hebrician, yet confeſſeth, that neither he, nor the *Rabbins* themſelves, doe know the true meaning or ſignification of the proper tearms there uſed. Therefore the Hebrew word *Harbe*, which we tranſlate *Locuſt*, the Septuagints call *Bruchus*, which is another kind of Inſect. And the *French* in their Bibles have left the Hebrew word untranſlated. And ſo did *Luther* before, as not knowing what that word meant, nor the other three Hebrew words. Dr. *Brown* then had done well rather to have reckoned the Baptiſts eating of Locuſts among the Vulgar Errors, then his feeding upon hearbs in the Deſart.

III. There is no fleſh ſo much ſubject to putrefaction, as mans body, becauſe it abounds in heat and moiſture, ſo that oftentimes ſome parts of it doe putrifie before the ſoul leave it, which cannot ſo long preſerve it from corruption, as ſalt, ſpices, the juice of Cedar, and other means by which the Ægyptians uſed to embalm their dead bodies. For indeed heat and ſiccity are enemies to putrefaction; therefore where the ambient air (which is properly moiſt) is excluded, there the bodies remain unputrified. Hence the bodies which are digged out of the hot and dry ſands in Egypt, have there continued many hundreds of years uncorrupted. *Alexanders* body lay many days unburied and unbalmed, yet ſtunk not, but ſmelled odoriferouſly, becauſe he had dried up the ſuperfluous moiſture of his body, by continual drinking of ſtrong and fragrant wines. There

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be alſo ſome wines that preſerve dead bodies uncorruptible, by reaſon of their cold and exſiccating quality. So we read in the *Indian* ſtories, that upon the Mountains of *Chily*, bodies have been found dead there; which have many years without corruption continued. The firſt detectors of thoſe Countries found it ſo by experience; for many of them were killed by the piercing ſubtil quality of thoſe winds, and preſerved from putrefaction by the exceſſive drineſſe thereof. I have read of Horſemen ſitting on Horſe-back, with their bridles in their hands, yet dead many months before without any corruption. It is alſo the opinion of ſom, that bodies thunder-ſtruck do not putrifie. I am apt to believe, that either they putrifie not at all, or not in a long time, becauſe of the exſiccating quality of the ſulphurous vapour which comes from the thunder and lightning. But there is nothing more apt to preſerve dead bodies from corruption, then the juice of Cedar, therefore much uſed among the Ancients, both in preſerving of their books and bodies; which by reaſon of their extream bitterneſſe and driing quality, gives life to the dead, and death to the living, extinguiſhing the temporary life of the body, and in recompence giving it immortality. So then we ſee that ſiccity is the main enemy to putrefaction, which is the cauſe the Peacocks fleſh is not ſo apt to putrifie as of other creatures, becauſe of its drineſſe, as Saint *Auguſtine* in the *City of God* ſheweth, who ſpeaks of a Peacock which in a whole year did not putrifie. The diet alſo is a great help to further or retard putrefaction; for they that feed plentifully on fleſh, fiſh, or other humid meats, which breed much blood and humours, are apter to putrifie then thoſe who feed ſparingly on hard and dry meats. In the ſiege of *Amida*, by *Sapor* the Perſian King, this difference was found; for the *European* bodies, who lay four days unburied, did in that time ſo putrifie, that they could ſcarce be known: but the Perſian bodies were grown hard and dry, becauſe of their hard and dry food, having contented themſelvs with bread made of *Naſturtium*, which we call Creſſes, or noſe-ſmart, an hot and dry hearb. Concerning the ſtone *Sarcophagus* which conſumes fleſh in forty days, as *Pliny* witneſſeth, *l.36. c.17.* is no fable; for *Scaliger* writes, (*Exerc.* 132.) that in *Rome*, and in the Town where he then was, the dead bodies were conſumed in eight days. But the ſtone *Chernites* is a preſerver of fleſh from corruption; therefore the Tomb of *Darius* was made of it. The like is written of the hearb *Clematis*, or *Vinca pervinca*, which reſiſteth putrifaction; there-

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fore of old they uſed to binde the heads of young men and maids deceaſed with garlands of this hearb. And *Korrimanus* (*de mirac. mortuorum*) ſpeaks of a dead head ſo crowned with this hearb, which in the year 1635. being taken out of the grave, was found uncorrupted. And as dead bodies embalmed with ſpices, are preſerved from corruption; ſo by the ſame dead bodies, men are oftentimes preſerved alive: for that ſtuffe which proceeds from them, called by the *Arabians Mumia*, is an excellent remedy againſt diſeaſes ariſing from cold and moiſture. *Francis* the firſt carried always ſome of it about him. It was found in the Tombs of thoſe Princes who had been imbalmed with rich ſpices; but that which is found in ordinary graves, is not the true *Mumia*, but falſe, uſeleſſe, or rather pernicious for the body, as not being of the ſame materials that the true *Mumia* was.

IV. That the preſence of a dear friend ſtanding by a dying man, will prolong his life a while, is a thing very remarkable and true, and which I found by experience: for about tenne years ago, when my aged Father was giving up the ghoſt, I came towards his beds ſide, he ſuddenly caſt his eyes upon me, and there fixed them; ſo that all the while I ſtood in his ſight, he could not die till I went aſide, and then he departed. Doubtleſs, the ſympathy of affections, and the imagination working upon the vital ſpirits, kept them moving longer then otherwiſe they would have done; ſo that the heart the ſeat of affection, and the brain the houſ of imagination, were loth to give off, and the ſpirits in them, to reſt from their motion, ſo long as they had an object wherein they delighted. The like I have read of others: And truly the ſympathy of affections, and ſtrength of imagination is admirable, when the mind is able to preſage the death or danger of a friend though a great way off. This alſo I found in my ſelf: For once I ſuddenly fell into a paſſion of weeping, upon the apprehenſion I took that my dear friend was dead whom I exceedingly loved for his vertues, and it fell out accordingly as I preſaged; for he died about the ſame hour that I fell into that weeping fit, and we were at that time 60 miles aſunder, nor could I tell certainly, that he was dead till two days after. Thus to ſome the death of friends is preſaged by bleeding at the noſe, and ſudden ſadneſs, by dreams, and divers other ways, which the learned Poet was not ignorant of when he ſaith,

Agnovit longe gemitum præſaga mali mens. Æn. l. 10. So by the Greek Poet the ſoul is called *κακόμαντις*, a ſoothſayer of evil:

evil: The cauſe of this the *Gentiles* aſcribed to the Sun, which they held to be the Soul, and our ſouls ſparks of that great Lamp. A *Platonical* conceit which thought mens ſouls to bee materiall; we were better aſcribe this to the information of that Angel which attends us.

V. That which *Herodotus* (*in Thalia c.* 3.) writes of this difference between the Perſian and the Ægyptian skuls, may be no fable; for in the wars between them ſuch as were killed on either ſide, were buried apart: after their bodies were putrified, it was found that the Perſian skuls were ſoft, but the Ægyptians ſo hard, that you could ſcarce break them with a ſtone. The reaſon of this might be, becauſe the Ægyptians uſed from their childhood to cut their hair, and to go bareheaded; ſo that by the Sun their skuls were hardned. Hence it was, that few among them were found bald; but the Perſians who wore long hair, and had their heads always covered, muſt needs have had ſoft skuls, by reaſon the humidity was kept in, and not ſuffered to evaporate, nor the Sun permitted to harden them.

CHAP. II.

1. *The benefits of ſleep, and reaſons why ſome ſleep not.* 2. *Why dead bodies after the ninth day ſwim. Why dead and ſleeping men heavier then others; why a blown bladder lighter then an empty.* 3. *Strange Epidemical diſeaſes and deaths. The force of ſmels. The Roſes ſmell.* 4. *Strange ſhapes, and multitudes of worms in our bodies.* 5. *The French diſeaſe, and its malignity. The diſeaſes of Braſil.*

WHereas Sleep is one of Natures chiefeſt bleſſings for refreſhing of our wearied ſpirits, repairing of our decayed ſtrength; moiſtning of our feebled limbs, as the Poet ſpeaks, *feſſos ſopor irrigat artus*, (Virg. Æn 3. & 4.) for eaſing of our diurnal cares, *Poſiti ſomno ſub nocte ſilenti, lenibant curas & corda oblita laborum.* And therefore is, as *Euripides* cals it, φάρμακον πόνων, the remedy of our evils. And whereas in ſleep the heart is at reſt, as *Ariſtotle* rightly ſaid, (though *Galen* who underſtood him not, checks him for it) from feeling, underſtanding, and inventing, though not from life and motion; I ſay, whereas by ſleep we have ſo many benefits, it is a wonder that any ſhould bee found to live a long time without ſleep. Yet I read in *Fernelius* (*Pathalog. l.* 5. *ca.* 2.) of one who lived fourteen moneths without any reſt. And it

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is more strange what *Heurinus* (*Praxis*, *l.*2.*c.* 7. records of *Nizolius*, that painful Treasurer of *Cicero*'s words and phrases, who lived ten years without sleep. *Mecænas* was sleepless three years, saith *Pliny*. *Laurentius* in his Tract of Melancholy, knew some who could not sleep in three moneths; the reason of this might be, 1. The heat and drinesse of the brain, as is usual in decrepit and melancholy men. 2. The spareness of diet, so that no vapours could be sent up to moisten the brain or nerves. 3. The want of exercise and motion; for sedentary men are least given to sleep. 4. Continual cogitation and intention of the phantasie. 5. And adust melancholy humours. 6. Accompanied with continual fears, horrid and distemperate phantasies, representing to the mind unpleasant objects.

II. Why dead bodies after the ninth day swim upon the water, may seem strange, seeing till then they lie hid under the water. *Cardan* (*de subtil. l.*8.) gives this reason, Because *between the Peritoneum and Omentum flatulent matter is ingendred, as appears by the great swelling of the belly.* Now this flatulent matter is begot of humidity dissolved by heat, which heat is procreated of putrifaction. Besides, we see that putrified bodies, as eggs, fruit, wood, grow light, because their solid parts being consumed, what remains are porous and full of air: for experience teacheth us, that the more porous and aereal the body is, the lighter it is, and lesse apt to sink; and perhaps may bee the reason why that body which wants the Spleen swimmeth, not being a porous light substance: And these men who have capacious lungs to hold much air, can dive and live longer in the water then others. And surely some people whose bodies are active, subtile, and quick, will not sink so soon as men of duller spirits. Such were the *Thebii*, a people which could not sink; so that it is a vain way to conclude those to be Witches, who do not presently sink. Hence also it is plain, that dead bodies are heavier then living, though Dr. *Brown* (*of Errors*, *l.*4.*c.*7.) contradict this, because *he found no difference between a Mouse and a Chick being dead and alive, in respect of gravity.* A weak reason to reckon a received truth among his vulgar errors; for though there were no sensible difference in such little animals, which have but few spirits, yet in men which are of a greater bulk, & in whom do abound vital and animal spirits, to say there is no difference of gravity in their life and death, is to contradict sense and reason; for every woman that attends upon sick men, knows that they are more pondrous when dead, then when alive, being us'd

to liſt and turn them. Reaſon alſo grounded on experience, teacheth us, that thoſe bodies are lighteſt in which air is predominant; therefore doubtleſſe where there is ſtore of ſuch pure and refined air as the ſpirits are, there muſt be leſſe gravity, then where they are vvanting: his Error is grounded on a falſe ſuppoſition, in thinking there is gravity in the ſpirits themſelves, becauſe they participate of corporeity, as if gravity vvere an eſſential property of bodies, vvhereas there is no gravity in the pure fire, nor in the Stars and Heavens, and yet theſe are bodies. Beſides, if the ſpirits had any gravity in them, it muſt follow, that living bodies are heavier then dead carcaſſes, which is abſurd to think. Again, I would know, vvhy inebriated Apoplectical and ſwouning perſons are heavier then others; is it not becauſe their ſpirits fail, and they reſemble dead men? And ſo in ſleep the brother of death the body is heavier; every Nurſe that carrieth her child in her arms will tell him this. Why doth a man fall down in his ſleep, who ſtood upright when he was awaked, If he be not heavier then he was? The Scripture acknowledgeth, that even the Apoſtles eyes vvere heavy vvhen they vvere ſleepy. And vvhereas he proveth the ſpirits to add vveight to the body, becauſ *a man that holds his breath is weightier while his lungs are full, then upon expiration: And a bladder blown is heavier then one empty.* I anſwer, that I could never find this experiment true, though I have made trial. 2. It ſeems to be falſe, becauſe the blown bladder vvill ſwim vvhen the empty one ſinks. 3. If I ſhould yeild him this, yet his ſequel is nought, except he can prove the animal ſpirits in a mans body, to be as thick and courſe as the groſſe vapour which is blown into the bladder, which is neither air in name nor purity, much leſs to bee compared to thoſe ſubtil ſpirits, vvhich are ſo pure and apt to vaniſh, that nature vvas forced to incloſe them vvithin the thick walls of the nerves. So likewiſe the air retained in the lungs, may perhaps add vveight to the body, becauſe the longer it ſtays there, the more it degenerates into a thick vapour, by reaſon of the bodies moiſture, and ſo may become ponderous.

III. God is pleaſed many times to puniſh whole Nations by extraordinary epidemical diſeaſes, for the ſins of the people. So vvas *England* viſited vvith a ſweating ſickneſſe; ſo vvas *Poland* with that diſeaſe called Plica, of vvhich vve have ſpoken; ſo vvas *Ethiopia* (as is already ſaid) viſited vvith the Louſie diſeaſe. *Foreſtus* (*Obſerv. medic. part.* 3.) records, that in *Syracuſa*

cuſa, there vvas an univerſal diſeaſe, called the hungry ſickneſſe, in vvhich people did continually deſire to eat, and vvere never ſatisfied. Of this multitudes died; at laſt it vvas obſerved, that this diſeaſe proceeded of Worms, vvhich vvere expelled by *Bolarmenick* and *Treacle*. And *Hollerius* reports, that at *Beneventum* many died of intolerable pains in the head, cauſed by Worms ingendred there, vvho alſo mentions one *Italian*, who by ſmelling much to the hearb *Baſil*, had a Scorpion which bred in his brain, and killed him; this is not impoſſible if vvee conſider, that according to the diſpoſition of the patrified matter, and the preparations made for introduction of the form, divers ſhapes of creatures are begot; and it ſeems there is a great ſympathy between the Baſil and the Scorpion, vvhich did facilitate the generation: neither are vve ignorant vvhat force there is in ſmells, both to breed and expel diſeaſes; and even to prolong and ſhorten life; as appears in divers Hiſtories, of ſome that have died vvith the ſmell of coals, others of new vvort or ale, as thoſe two Monks recorded by *Foreſtus* (*Obſerv. medic. part.* 1.) although I ſuppoſe it vvas not ſo much the ſmell as the ſmoak of the coals and vapours of the air that ſuffocated the ſpirits; yet ſuch is the force of ſmells, that ſom have been purged by paſſing by or entring into Apothecaries ſhops, vvhileſt they vvere preparing purgative medicaments; And divers with the ſmell of the purges vvhich they carried in their hands, have been as much purged, as if they had taken the whole ſubſtance. But this I aſcribe not ſo much to the ſmell (vvhich is a meer accident, and cannot paſſe from one ſubſtance to another, but is in ſome ſubjects wherein it is inherent) as to the ſubtile vapours vvhich from the phyſick being ſmelled, convey the ſmell to the body. The ſame reaſon may be given why ſome are offended with ſmells which to others are pleaſant; ſo I have read of *Francis* the firſts Secretary, who was forced to ſtop his noſthrils with bread when there were any apples at table: and ſo offenſive was the ſmell thereof to him, that if one had held an apple neer his noſe, he would fall a bleeding. *Marcel. Danat. adm. hiſt. l.6.c.4.*

And Cardinal *Caraſa* did ſo abhor the ſmell of roſes, which of all ſmells is moſt delightful to man, that during the roſe time he durſt not go out of his doors, for fear of encountring with that ſmell; nor did he ſuffer any to come within his palace that had a roſe about him. This I adſcribe to the phantaſie and naturall antiphathy between him and the roſe: Such power there is in ſmells, that the Ancients aſcribed a Divinity to

them; and becauſe good ſmells do ſo chear the ſpirits, hence they were uſed in Temples both amongſt Jews, Gentiles, and Chriſtians. *Homer* deſcribes his *Juno* by the ſweetneſſe of her ſmell, and ſo doth *Virgil* his *Venus*: *Ambroſiæque comæ divinum vertice odorem ſpiravere*; the like doth *Plutarch* his *Iſis*, and ſo doth *Ovid*: *Manſit odor, poſſis ſcire fuiſſe Deam.* But for the Roſe there may be ſome manifeſt cauſes why its ſmell may bee offenſive: for ſome brains are extraordinary cold, ſome extraordinary dry, and whoſe olfactive paſſages are wider then uſually; to ſuch the ſmell of Roſes may be hurtful, becauſe the Roſe hath but a weak heat, or rather is refrigerative, as *Dioſcorides* thinks which may comfort the hot, but not the cold brain. And if the brain be dry, & the paſſages wide, the ſmel doth too ſuddenly affect it, which may procure an aking. but why Hyſterical women, and ſuch as are troubled with the Mother, are apt to ſwoun at the ſmell of Roſes and Lillies, and other ſweet odours, is, becauſe the Matrix delighteth in theſe ſmells, and therefore riſeth toward them, to the danger of ſuffocation; whereas it is ſuppreſſed by ſtrong and unpleaſant odours. There are indeed in the roſe different parts, which have different qualities, but the predominant are moiſtning and coldneſs; whence to cold and moiſt brains, the ſmell is not proper, but to hot brains the roſe is comfortable: therefore the Ancients in their drinking matches, uſed to wear roſe garlands, and to lie upon beds of roſe-leaves for refrigeration. *Mitte ſectari roſa quo locorum ſera moretur. Horat. l.* 1.

IV. It is almoſt incredible, what is written of the multitudes, divers ſhapes, and length of worms bred in our bodies, if we had not the teſtimony of ſo many grave Phyſitians to prove this. *Foreſtus* out of *Hoſtim* (*Obſ. Med. part.* 1. *Obſ.* 2.) ſhews, that at *Beneventum* in *Italy*, there was a great mortality, which much troubled the Phyſitians, not knowing the cauſe thereof, till they opened one of the dead bodies, in whoſe brain they found a red worm yet alive: This they tried to kill by divers medicaments, ſuch as are preſcribed againſt worms, but none of them could kill it. At laſt they boiled ſome ſlices of Radiſh in *Malago* wine, and with this it was killed. He ſhews alſo, that one being cured of the *French* malady, was notwithſtanding ſtill tormented with the head-ach, till his skull by advice was opened; under which, upon the *Dura mater*, was found a black worm, which being taken out and killed, he was cured. *Braſavola* records, (*in* 16. *Aphoriſ. l.* 3. *Hippocr.*) that an old man of 82 years, by a potion made of *Scordium* and ſea-moſs, voided

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five hundred worms, which was the more ſtrange in ſo old a man, whoſe body muſt needs have been cold and dry; yet it ſeems he wanted not putrified matter enough to breed them. *Alexander Benedict* ſpeaks of a young maid, who lay ſpeechleſs eight days with her eyes open, and upon the voiding of forty two worms, recovered her health, (*lib. de verit. & rerum.*) *Cardan* records, that *Eraſmus* ſaw an *Italian*, who ſpoke perfect *Dutch*, which he never learned, ſo that he was thought to bee poſſeſſed; but being rid of his worms, recovered, not knowing that he ever ſpake *Dutch*. It is not impoſſible in extaſies, phrenſies, and tranſes, for men to ſpeak unknown tongues, without witchcraft or inſpiration; if we conſider the excellency and ſubtilty of the ſoul, being ſequeſtred from corporeal Remora's, and ſo much the rather, if with *Plato*, we hold that all our knowledge is but reminiſcency. *Ambroſe Parry* (*lib.* 19. *c.* 3.) ſheweth, that a woman voided out of an impoſthume in her belly; a multitude of worms about the bigneſs of ones finger, with ſharp heads, which had pierced her inteſtins. *Foreſtus* (*l.* 7. *Obſ.* 35.) tells us of a woman in *Delph*, who in 3 ſeveral days voided 3 great worms out of her navel; and not long after was delivered of a Boy; and then ſeven days after that, another. *Thad. Dunus*, ſpeaks of a *Switzer* woman, who voided a piece of a worm five ells long, without head and tail, having ſcales like a Snake. After this ſhe voided another bred in her bowels, which was above twenty ells long. This poor woman was tortured ſo long as ſhe was faſting; but when ſhe ate, ſhe had ſome eaſe. I could ſet down here many other ſtories of Worms, voided out of mens bodies, ſome having the ſhape of Lizards, ſome of Frogs, ſome hairy and full of feet on both ſides, ſome voided by the eyes, ſome by the ears, ſome by vomiting, ſome by the ſtool, ſome by urine, ſome by impoſthumes, but I will not be tedious; theſe may ſuffice to let us know of what materials this body of ours, which we ſo much pamper, is compoſed, and how little cauſe vve have to be ſollicitous for the back and belly; and vvithal let us ſtand in awe of God, vvho vvhen he pleaſeth can for our ſins, plague us vvith vermin in our bodies vvhiles vve are yet alive.

V. I ſaid before, that divers Countries had their peculiar diſeaſes; the *French* ſickneſs as vve now call it, vvas peculiar to the *Americans*, and not known to this part of the vvorld; but *Chriſtopher Columbus*, brought it from *America* to *Naples*. Now it is become common, and yet no diſeaſe more pernicious, and vvhich breeds more dangerous ſymptoms and tortures

in the body. This is that great ſcourge with which God whips the wantonneſſe of this laſcivious age: not without cauſe is this called the *Herculean* diſeaſe, ſo hard to be overcome, and the many-headed *Hydra*: the poiſon of it is ſo ſubtile, that not only it doth waſt the noble parts, and ſpoils the skin even to the loſſe of all the hairs both of head, beard, and eye-brows, beſides the many ſwellings and bunches it cauſeth, it pierceth alſo into the very bones, and rots them, as *Fernelius* fully deſcribes. (*De abdit. rer. cauſis, l.* 2.) I have read of ſome who have been ſuddenly ſtruck blind with the infection thereof. *Zacuta* mentions one who was ſo blinded that he could never recover his ſight again. And another who was troubled with an Ophthalmy, the poiſon of which was ſo violent and ſubtile, that it infected the Chyrurgion that cured him; (*Prax. mira. l.* 2.) by which it appears this diſeaſe is infectious at a diſtance. There is another peculiar diſeaſe in *Braſile*, called the Worm, which comes with an itch and inflammation of the fundament: if this be taken in time before the Fever comes, it is eaſily cured by waſhing the place affected, with the juice of Lemmons, whereof that Countrey abounds; but if it be neglected till it come to a Carbuncle, it is harder to be cured, and not without the juice of Lemmons and Tobacco. But if this by careleſneſſe be omitted, no help will then prevail; and ſo the party dieth with a thirſt or fever, which is ſtrange. Not unlike to this is that diſeaſe which *Zacuta* ſpeaks, of one who was tortured with a terrible pain in his Hip and Fundament, with a violent Fever: upon this he openeth the outward ancle vein, out of which guſhed ſcalding blood, and with it a living Worm, the breadth of ones palm, and ſo the party was cured. It ſeems the poiſon of this Worm had reached into the Hemorrid veins in the fundament, which cauſed that pain. *Linſchoten* (in his voiages) makes mention of another diſeaſe familiar to the *Braſilians*, called *Pians*, proceeding from their letchery; it maketh bliſters bigger then the joynt of a mans thumb, which run over the whole body and face.

CHAP.

CHAP. III.

1. *Centaurs, proved what they were.* 2. *Why the sight of a Wolfe causeth obmutescency.* 3. *Pigmies proved. Gammadim, what.* 4. *Giants proved: they are not monsters.* 5. *The strange force of Fascination. The sympathies and antipathies of things. The Loadstones attraction, how hindred. Fascination, how cured. Fascination by words.*

THat there have been *Centaurs*, that is, Monsters, half Horses, and half Men in the world, I make no question, though Dr. *Brown*, (*Book* 1. *c.* 4.) reckons this among his *Vulgar Errors*, who should have made a distinction between Poetical fictions, and real truths: For *Centaurs* are Monsters, and aberrations from nature; not the common nature of all things, which intends and effects Monsters, to shew Gods wrath against sin: but from the particular nature of those creatures of which they are ingendred. Therefore S. *Jerome* in the life of *Paul* the Eremite, speaks of a *Centaur* seen by *Paul*. *Pliny Nat. Hist. l.* 7. *c.* 3. was an eye-witnesse to this truth: For he saw in *Thessaly* a *Centaur*, which was brought out of *Egypt* to *Claudius Cæsar*. *Ambrose Parry* (*l.* 15. *de Monstris*) speaks of a *Centaur* which in the year 1254, was brought forth at *Verona*: there is no doubt then but Centaurs as well as other Monsters, are produced, partly by the influence of the stars, and partly by other causes, as the ill disposition of the matrix, the bad temperature of the seed, the perverse inclination of the woman, the commixtion of seeds of divers kinds, sudden fear, bad diet, unwholsome air, and untimely *Venus*. But we must not think that these Centaurs were men, or parts of men; for they had not a reasonable soul, and therefore not capable of the resurrection. Neither must we think that these had two natures and essential forms in one body, to wit, of a Man and a Horse: for as every entity hath but one specifical essence, so it hath but one form which giveth that essence; so that one and the same thing cannot be under divers species in the predicament of substance. And as there cannot be two distinct forms, so neither can there be a mixtion of them in the Centaur: For the form or essence admits neither intention nor admission: *Ex duobus entibus per se, non fit unum ens per se*; yet I deny that there were ever a generation of people called *Centaurs*, as they are described by the Poets; for by this fiction they under-

underſtood voluptuous and laſcivious men, who by *Hercules*, that is, men of courage, wiſdom, and ſtrength, were ſubdued and brought to civility, as we have ſhewed elſewhere (*in Myſt. Poetico*) which fiction was occaſioned by the firſt ſight of men on Horſeback in *Theſſaly*.

II. That ſome men have become ſpeechleſſe at the ſight of a Wolf, is no fable, if either wē conſider the antipathy that is between a Man and a Wolf, or the malignity of that vapour which proceeds from the Wolf, or the violence of a ſudden fear which preſently bringeth obmuteſcency, as the Prince of Poets ſheweth, (*Æn.* 2.) *Obſtupui ſteteruntq; comæ & vox faucibus hæſit. Camerarius* the Father (*Prob* 1. *Dec.* 7. *medit. Hiſtor. part.* 2. *Cent.* 40.) ſheweth in his Problems, (which is confirmed by *Philip* his ſon) that one who had caught a Wolf in a Gin, by comming too neer him, was ſo poiſoned by his breath, that his hands and face which were naked, did ſwell to a monſtrous bigneſs: ſo that in a long time he could ſcarce be cured. And what wonder is it, that the ſight of a Wolf ſhould make a man ſpeechleſſe, when the ſhadow of the Hyena, will make a Dog dumb; when a Horſe, if he ſmell but the foot-ſtep or the guts of a Wolf, will kick and fling as if he were mad, and a Mare will caſt her Colt, as they witneſs who write the Natures and Hiſtories of beaſts; therefore the Proverb, *Lupus in fabula*, vvas not grounded upon a fable. Dr. *Brown* then did unadviſedly reckon this among his *vulgar errors*, (3 *Book* c. 8.) for I believe he would find this no error, if he were ſuddenly ſurpriſed by a Wolf, having no means to eſcape or ſave himſelf; and yet I do not hold that every one vvho is ſeen by a Wolf, is dumb, becauſ ſome are of undaunted ſpirits, and ſome have the advantage of the Wolf, and ſome are not apt to be infected by his breath; yet it will not follow, that it is a vulgar error; if I hold a man grows ſilent at the ſight of a Wolf, or that he hath an infectious breath: For it is no *vulgar error*, to hold the plague an infectious diſeaſe, and yet all are not infected by it.

III. That there have been Pigmies in the world, that is, people of a cubit or two high, ſo called from πόηων a cubit, and *Troglodits* from τρώγα an hole, for they dwelt in holes, as *Ariſtotle* ſheweth; and *Spithamei* from their ſmall ſtature, ſcarce exceeding 2 foot and a quarter: I ſay, that there have been ſuch, I make no queſtion, when I conſider the multitude of eminent Authours who have vvrit of them, and that no reaſon vvas ever yet alledged to deny them. Nay, it ſtands vvith reaſon there ſhould be ſuch, that Gods wiſdome might be ſeen in all

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ſorts of magnitudes: For if there have been Giants, why not alſo Pigmies, Nature being as propenſe to the leaſt as to the greateſt magnitude: Beſides, the reaſonable ſoul is not extended in the body of a Giant, nor contracted in the body of a Pigmie; but can inform the one and the other without augmentation and diminution. *Nicephorus* (*lib. hiſt. Eccleſ. c.* 37.) affirms, that in the time of *Theodoſius*, was ſeen in *Egypt* a Pigmie ſo ſmall of body, that he reſembled a Partridg; he exerciſed all the functions of a man, and could ſing tunably. *Pliny* (*lib.* 7. *c.* 16.) ſpeaks of *Conopas*, whom *Julia* the Neece of *Auguſtus* kept ſtill by her; he was not much above two foot long. He alſo affirms, that under *Auguſtus* there lived *Puſio* and *Secundilla*, whoſe bodies were preſerved as miraculous in a monument within the Saluſtian Gardens; they were not much above half a foot. *Cardan* relates (*de ſubtil.*) that there was in *Italy* a Pigmie of a cubit long, kept in a Parrets Cage. Many more of theſe Pigmies I could alledg, but theſe ſhall ſuffice to ſhew there have been ſuch. And that there have been a Nation of Pigmies, *Ariſtotle*, *Pliny*, *Pomponius*, *Mela*, *Aulus Gellus*, *Solinus*, *Albertus magnus*, and many others will witneſs. It is true that *Strabo*, *Scaliger*, and ſome others have denied them; and therefore Dr. *Brown* reckons the opinion concerning Pigmies, among his *Vulgar Errors*. But if the incredulity of two or three Writers be enough to make a *Vulgar Error*, what a multitude of Errors will there be? For what truth is there in the world which by ſome or other hath not been doubted or denied? But they ſay, that the Aſſertors of this opinion, do not agree about the place of the Pigmies abode; ſome placing them in *India*, ſome in *Ethiopia*, ſome in *Scythia*, ſome in *Greenland*. I anſwer, Circumſtantial differences cannot overthrow the ſubſtance of a truth. Much difference there is about *Ophir*, where it ſtood, ſome placing it in *Sumatra*, or *Aurea Cherſineſus*, ſome in *Africa*, ſome in *Peru*. So men cannot agree about *Tharſis*, ſome making it a Town in *Cilicia*, others *Carthage* in *Africa*, ſome *Tartaſius* in *Spain*; ſhall we hence infer that there were never any ſuch places? I am of opinion, that becauſe they differ in the place of the Pigmies, and not in the thing it ſelf, that there were Pigmies in all the forementioned places. *Buchanan* ſpeaking of the Iſles of *Scotland*, amongſt the reſt, ſets down the Iſle of Pigmies, in which there is a Church where are yet digged up divers ſmall ſkuls and bones, anſwering to the report of the Pigmies little bodies; ſo that the inhabitants and neighbours make no queſtion, but

that

that Pigmies of old dwelt there. *Rer. Scot. l.* 1. Now *Ariſtotle* is ſo confident of his Pigmies, that he plainly tels us it is no fiction, but a manifeſt truth, *Hiſt. animal. l.* 8. *c.* 12. ἐκ δὲ τοῦ τὸ μῦθον ἀλλ' ὅτι καὶ τῷ ἀληθεῖαν. And it is like that theſe Pigmies were all one with the *Nabæ* or *Nubæ*; a people that dwelt about the Springs of *Nilus*, and ſo they are called Νῶβαι Πυγμαῖοι, both theſe people are ſaid to dwell about the Springs of *Nilus*, both were *Troglodits*, or dwelt in holes. And *Nonneſus* in *Photius* is ſaid to have lighted upon theſe Pigmies in his Navigation about thoſe places where the *Nubæ* dwelt. Neither is it a ſufficient reaſon to denie Pigmies, becauſe ſome ridiculous things are written of them, as that they fight with Cranes upon the backs of Rams, or Goats, though this be ridiculous, yet it may be true; for there are ſome ridiculous truths, and ſome ſerious lies. But if this were a fable, yet that there were Pigmies, may be a truth: there be many fictions made of *Saturn*, *Jupiter*, *Janus*, and other Heathens, Likewiſe of S. *Chriſtopher*, S. *George*, S. *Francis*, and many other Chriſtians; ſhall we therefore conclude there were never any ſuch men? Neither was *Homer* the firſt that makes mention of Pigmies: for *Ezechiel* long before ſpake of them (*Ezek.* 27.11.) for the word *Gammadim* is tranſlated Pigmies by *Aquila*, *Vatablus*, *Lyra*, *Arias Montanus*, the vulgar *Latin*, and *Munſter*, who affirms that all the *Hebrews* expound the word thus. Beſides, the *Italian* and *Spaniſh* Tranſlations uſe the word Pigmie, and do not retain the textuary word, as the Doctor thinks, though the *French* and *Engliſh* Tranſlations do. Now why the *Septuagints* tranſlated the word *Gammadim* into Watchmen, I know not, except they meant thoſe three thouſand Pigmies which a certain King of *India* did entertain for his Guard; for though they were ſmall of ſtature, yet they were good Archers.

IV. That there have been Giants, that is, men of extraordinary ſtrength and ſtature, is not to be queſtioned, ſince they are mentioned in ſo many Stories often in the Scripture: For what were *Og*, *Sampſon*, *Goliah*, and the *Anakims*, but Giants? It is written that *Pallas*, the Son of *Evander*, whom *Turnus* killed, was higher by the head then the Walls of *Rome*: For eight hundred years after Chriſt, his body was found near the Walls, which being ſet upon its feet, the ſhoulders thereof touched the Pinacles of the Wall. S. *Auguſtine* (*de Civit. Dei, l.*15.*c.*9.) ſaw a mans tooth bigger then his fiſt. *Joſ. Acoſta* (*Hiſt. Ind. l.*7.) ſhewes there were Giants in new *Spain*:

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For he ſaw, at *Mexico*, a tooth as big as a mans fiſt. About the Straights of *Magellan* there are Giants ten or eleven foot high. (*Acoſt. l.*1.*c.*9.) The bones of Giants found in *Peru*, are thrice as big as the *Indians*. *Cambden* tells us of two teeth found in *Eſſex*, which would make two hundred of ours. And if you will believe *Nuneſius* the Jeſuit, (*de rebus Japan*) the King of *China* was guarded with Giants, which are alſo the Porters of his chief City. I will ſay nothing of the Giants mentioned by *Pliny*, *Plutarch*, *Herodotus*, and others. Before the Flood there were greater ſtore of them then ſince, becauſe the vigour of the Sun, the fertility of the earth, the goodneſſe of food, and the ſeed of generation did decay. But we muſt not think that Giants and Pigmies are Monſters, ſeeing they are not the errors of nature, which aimeth at their generation, according to the proportion of ſeed, which admits of extenſion and remiſſion: But if the quantity be ſuch, that the functions of man are hindred, ſuch may be called Monſters, as that young Giant at *Millan*, which *Scaliger* ſaw, (*Exerc.*263.) which was ſo tall, that he could not ſtand, but lie along, extending his body the length of two beds joyned together. What the *Greeks* have feigned of the Giants, I have ſpoken elſewhere, *Myſtag. Poet.*

V. That divers diſeaſes are procured by faſcination, that is, by a malignant look, or aſpect, is manifeſt by innumerable teſtimonies of good Authours. Now faſcination is twofold, Diabolical and Phyſical, or Natural: Of the former I doe not ſpeak, but of the latter, which cauſeth diſeaſes, not by the look, or ſight it ſelf, which conſiſteth rather in reception with *Ariſtotle*, then in emiſſion with *Plato*, (although I deny not ſome kind of emiſſion there is), but I ſay, faſcination cauſeth diſeaſes three ways: Firſt, when the horrid and truculent look of a malicious deformed Hag affrights children and tender natures; upon which proceeds an agitation and ſudden commotion of the ſpirits and humours, whence enſueth diſeaſes. Secondly, by ſome malignant vapour, breath, or ſpirit from the eye or mouth. Thirdly, by a ſecret antipathy: ſo there are who will ſwoun and ſwear at the ſight of certain meats which they abhor: And indeed ſympathies and antipathies there are almoſt in every Simple which we receive for phyſick, as *Fernelius* (*de abdit. rer. cauſ. l.*2. ſhews:) hence it is, that ſome things purge onely the Spleen, ſome the Liver, ſome the Breaſt only. Hence alſo the *Cantharides* are offenſive to the Bladder, *Lepus marinus* to the Lungs: But that Hiſtory is ſtrange which is recorded

corded by *Francis Mendoſa* (*lib.4. de Flor. Philoſ. Problem.* 11.) of the Duke of *Brigantia*'s one-eyed ſervant, who with his eye could make any Falcon or Sparrow-Hawk in their flight fall down to the ground as if they were dead : this could not bee by any maligrant vapour that did reach ſo high : it muſt bee therefore a ſtrange antipathy, of which we can give no more reaſon, then why the Load-ſtone draws Iron, or draws it not when touched with Garlick. Why the ſtone *Selenites*, as *Fernelius* ſhewes, touching the skin, ſhould ſtay bleeding in any part of the body : or why the Ring in which it is ſet, being put on the third finger, ſtays the Dyſentery within an howre : Why Rhubarb and Scamony purgeth choler; Epithemium, Polypodium and Sena, melancholy ; Agarick phlegme : and why Quick-ſilver delights ſo much in gold : Why the ſhadow of the Fraxinus or wilde-Aſh is ſo pernicious to Serpents. Why there is ſuch antipathies and ſympathies among Hearbs & Trees. I know what I ſaid but now (*Book* 2. *c.*3.) of the Garlick in hindring the Load-ſtones attraction, is contradicted by Doctor *Brown*, and before him by *Baptiſta Porta* ; yet I cannot believe that ſo many famous Writers who have affirmed this property of the garlick, could be deceived ; therefore I think that they had ſome other kinde of Load-ſtone, then that which we have now. For *Pliny* and others make divers ſorts of them, the beſt whereof is the Ethiopian. Though then in ſome Load-ſtones the attraction is not hindred by garlick, it follows not that it is hindred in none ; and perhaps our garlick is not ſo vigorous, as that of the Ancients in hotter Countries ; yet I finde, that not onely by garlick is this attraction hindred, but alſo by fire, ruſt, oyl, and other fat things, alſo by the preſence of another Load-ſtone ; and that as it draws the Steel with one end, ſo it repels it with the other. But to return to our Faſcination, that it is cauſed by an occult quality, is plain, becauſe it is cured by another occult quality : For *Mendoſa* (*Prob.* 11.) ſheweth, that it is known by experience how Faſcination is cured by the foot of a Mole or Wont laid to the childes forehead, which can be nothing elſe but a natural antipathy : and that Faſcination is cauſed by a contagious breath infecting the aire, is plain, by the ſtory of the Baſilisk killing with his look or breath rather, at a diſtance. There is alſo a Faſcination by words, which the Poet mentions, *Ecl.*11.

Qui ne ultra placitum laudarit, Baccharе frontem
Cingite, ne vati noceat mala lingua futuro.

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We know there is great efficacy in words to move the affections, upon which the ſpirits and humours of the body are diſturbed, which cauſeth oftentimes diſeaſes.

CHAP. IV.

1. *Strange ſtones bred in mens bodies.* 2. *Children nouriſhed by Wolves and other Beaſts.* 3. *Poiſon taken without hurt. Poiſon eaters may infect, how. How Grapes and other Plants may bee poiſoned.* 4. *Of ſtrange Mola's. Bears by licking, form their Cubs, the Plaſtick faculty ſtill working.*

THERE is nothing more ſtrange in mans body, then the generation of ſtones, whereof there be ſo many and diverſly ſhaped: in the joints ſtones are bred by the gout, called therefore *Lapidoſa Chiragra*; ſtones are bred ordinarily in the kidneys and bladder, of ſlimy matter by the heat of theſe parts; ſome are ingendred in the Liver and Spleen; ſome alſo in the heart. *Hollerius* ſpeaks (*Com.1. in lib.6. Sect.2. Aphor.4.*) of a woman which died of an impoſthume in the heart, wherein were found two ſtones; in the heart of *Maximilian* the ſecond Emperour, were found three ſtones, which afflicted him very much, with a trembling of the heart, as *Wyerus* witneſſes, (*l.4.c.16.*) In the inteſtins alſo ſometimes ſtones have beene found. *Zacutus* ſpeaks (*lib.3.de prax. ad obſ.124.*) of a young man diſordered in his diet, who uſed to void by the ſeed divers ſtones, and at laſt died of a ſtone that was found in his Colon, in form like a Cheſnut, and as big; this could not bee voided whileſt the party lived, neither by Glyſters nor Purges, nor any other phyſick: ſome have thought that theſe ſtones in the inteſtins are hardned by cold, which cannot be; for though intenſe cold doth harden as well as heat, which we may ſee in froſts hardning water and dirt, & in the generation of chryſtal: and though we ſhould yeild to *Galen*, that the inteſtins being membranous and ſpermatical parts are colder then the ſanguineal, yet we cannot yeild that in a living body, there is actual cold; for all parts are hot, yet ſome more, ſome leſſe; therefore theſe ſtones are not ingendred by cold, but by a preternatural heat in the body. The ſame *Zacutus* (*Obſ. 135. l. 2.*) ſpeaks of a ſtrange ſtone found in a mans bladder; it was round like a Ball, but had iſſuing from it divers pyramids, and between each of them a ſharp prickle like a needle, (*l.1. Obſ.96.*)

I have read of ſome who with coughing have voided ſtones out of their Lungs. One (*l.*1. *Obſ.*95.) by coughing voided a ſtone out of his Lungs, hard and long like a Date ſtone, ſo heavy that it weighed almoſt twenty one grains: But no ſtone ſo much to be admired was ever known, as that which was found in the matrix of a dead mother, of which we ſpake before, to wit, a dead childe that had continued there twenty eight years, and was turned to a ſtone.

I h. That ſome children have been nouriſhed by wild beaſts, many hiſtories do aſſure us: *Plutarch*, *Cicero*, and others tell us of *Romulus* and *Remus*, who were nouriſhed by a ſhee Wolf. *Juſtin* aſſures us, that *Cyrus* ſuckt the duggs of a Bitch. *Pauſanias* in his *Corinthiacks*, writes, that *Æſculapius* was educated by a Hinde. *Ælian* in his various Hiſtories, ſpeaks of a Bear which gave ſuck to *Atalanta*, being expoſed; of a Mare that nurſed *Pelias*; of a ſhe-goat whoſe duggs *Ægyſtus* ſucked; and of *Telephus* that ſucked a Hinde. Divers others I could alledg, but theſe are ſufficient to let us ſee the cruelty of ſome parents, and the kindneſſe of ſome beaſts far more merciful then man. Beſides, the ſpecial care and providence of God towards tender and impotent infants: Yet I know *Livy* contradicts the ſtory of the Wolf, that nurſed *Romulus*, and ſo doth Dr. *Brown*, having no other inducement but that of *Livies* authority, whereas the other Hiſtorians and Monuments of *Rome* affirm it. Beſides, it is no more incredible for a Wolf to nurſe a child, then for a Raven every day to feed *Elijah*. But beſides ancient ſtories, there be divers late Records of ſome children who have been nouriſhed by Wolvs within theſe few years in our neighbour Countries. In the Lantgrave of *Heſſe* his Countrey, was found a Boy who had been loſt by his parents when he was a childe, who was bred among Wolves, and ran up and down with them upon all four for his prey. This Boy was at laſt in Hunting taken and brought to the Landgrave, who much wondring at the ſight, cauſed him to be bred among his ſervants, who in time left his Wolviſh conditions, learned to walk upright like a man, and to ſpeak, who confeſſed, that the Wolves bred him, and taught him to hunt for prey with them. This ſtory is rehearſed by *Dreſſerus* in his Book of new and ancient Diſcipline, *Hiſt. Med. part.*1. *c.*75. The like ſtory hath *Camerarius* of two children, which had been bred among Wolves, and taken in the year 1544. I have read of a man bred among Wolves, and preſented to *Charls* the ninth of *France*. And a ſtrange ſtory is extant, written by *Lewis Guyon* Sieur

Sieur *de la Nauche*, (*l.2. Diverſ. Lection. c.34.*) of a childe that was carried away in the Foreſt of *Ardenne* by Wolves, and nouriſhed by them. This child having converſed with them divers years, was at laſt apprehended, but could neither ſpeak nor walk upright, nor eat any thing except raw fleſh, till by a new education among other children, his beſtial nature was quite aboliſhed. We ſee then it is not incredible for children to be nurſed by Wolves; of which perhaps the old *Iriſh* were not ignorant, when they prayed for Wolves, uſed them kindly, as if they had been their own ſons, as wee may read in *Cambden* (*Hiſt. Hiber.*) out of *Goade*.

III. That ſome can take poiſon without hurt, is plain by the ſtory of *Mithridates*, who could not be poiſoned.

Profecit poto Mithridates ſæpe veneno,
Toxica nè poſſint ſæva nocere ſibi.

This ſtory is confirmed by *Pliny*, *Gellius*, *Cælius*, and others. There is a ſtory of the King of *Cambaia*'s ſon, who by conſtant eating of poiſon, he had ſo invenomed his body, that the Flies which ſuckt his blood ſwelled and died. *Solinus* ſpeaks of a people called *Ophyophagi*, becauſe they fed on ſerpents. *Avicenna* ſpeaks of one in his time, whoſe body was ſo venomous, that whatſoever touched it died. I have read alſo in *Ariſtotle*, of a Maid who was nouriſhed with poiſon. The like ſtory is mentioned by *Avicen.* *Alb. Magnus* ſpeaks of a Maid who delighted to eat Spiders. S. *Auguſtine* (*de morib. Mon. S.* 2. *c.*8.) ſpeaks of a woman who drank poiſon without hurt. Many other examples there may be alledged; but theſe may ſuffice to let us ſee, that either by Art or by Nature mens conſtitutions may be fortified againſt the malignity of poiſon, as well as other animals which feed upon poiſon, as Vipers do upon Scorpions, Stares on Hemplock, Ducks on Toads, Quails on Hellebor, Poultry and Monkies on Spiders. Not to ſpeak of miraculous power, by which many Martyrs have been preſerved from poiſon, as was foretold in S. *Mark* ch. 16. *If they drink any deadly poiſon, it ſhall not hurt them.* Beſides, mens complexions according to their ages doe vary, ſo that what hath been poiſonable at one time, is not at another. Thus ſome that could not abide cheeſe in their youth, have eaten it in their age: We ſee alſo how cuſtome becomes another nature: for hot Climats to Northern men at firſt, prove pernicious, but afterward by cuſtome become familiar and natural: Therefore Dr. *Brown* (*Book* 7. *c.*17.) hath no reaſon to reiect that ſtory of the *Indian* King, that ſent unto *Alexander* a fair wo-

man fed with poiſon, purpoſely to deſtroy him by breath or copulation; becauſe ſaith he, that poiſons after carnal converſion, are ſo refracted, as not to make good their firſt and deſtructive malignity. I anſwer, They are not ſo refracted, but that they leave behind them in the fleſh, a venomous impreſſion and quality: For if the ordinary food we take, is not ſo maſtered by the ſtomach, but that by way of reaction (for *omne agens naturale in agendo repatitur*) it alters the body; much more muſt poiſons, which are more active. Hence hot bodies are cooled by Lettice, Sorrel, and other refrigerating meats; and cool bodies are heated by the frequent uſe of Spices and Wines, and other heating viands: we ſee that neither our ſtomach nor liver, can ſo maſter and retract garlick, onions, radiſhes, and divers other things we feed on, but that the urine will retain the ſmell thereof. The fleſh of the Thruſh, that feeds on Juniper berries, retains the reliſh thereof: The milk of the beaſt that feeds on Hellebor or Scammony, will purge the body. If an infectious breath or ſmell, can deſtroy another body; why may not the ſame bee effected by thoſe who are accuſtomed to eat poiſon? *Galen* tells us, (*l.*11. *Simpl.*) that by long uſe the fleſh may be infected by aliments. And *Capivaccius* affirms, that they are in danger to be poiſoned, who touch the dead bodies of thoſe who have been poiſoned. Therefore *Plato* reports, *l. de veneno in Phædra*) that their bodies who were condemned to die by poiſon, were waſhed before they drank the poiſon, not after, leſt the Waſhers might be infected. *Cardan* (*Se Subtil. l.* 9.) tells us, that though all vipers be poiſonable, yet thoſe are more venomous which feed on Toads: And which is more ſtrange, *Simon Gennenſis* aſſures us, that Grapes will become poiſonable, if whileſt the Vine is inoculating and graffing, poiſon be put in it; and the Wine will prove laxative, if Scammony be inſerted in the Vine; which alſo *Reynaldus de villa nova*, proves may be effected in other plants. Laſtly, that which is poiſon in one Countrey, is not poiſon being tranſported into another Climat, as it is known of the *Peach*, which in *Perſia* is venomous, but being tranſplanted, loſeth the deletorious quality.

IV. *Levinus Lemnius* tells us, that the *Belgick* women are much ſubject to falſe conceptions, (*l.* 1. *de occultis mir. c.* 8.) chiefly that which is called *Mola*; being as *Laurentius* writes, (*Anato.l.*8.) a [fleſhy infirm lump without motion, begot in the matrix of the woman, of imperfect ſeed.] Theſe are moſt ſubject

to

to thoſe conceptions, who are moſt addicted to diſordered copulation, not regarding the manner, time, or meaſure thereof. Nature indeed aiming at the eternity and propagation of the ſpecies, begins to elaborate a childe; but being hindred by the abundance, weakneſſe, and other vitioſities of the ſeed, and menſtruous blood, beſides the ill diſpoſition of the matrix, is forced to leave the work imperfect. Hence this lump remains inarticulate, and ſometimes is caſt out the ninth moneth, ſometimes ſooner, and in ſome it remains three or four years: in ſome it is bred without the help of man, only by the ſtrength of imagination, and mixture of the female ſeed with the blood. But this is denied by *Laurentius*, who alſo affirms the *Mola* to be without motion, which *Zacuta* contradicts (*Prax. Mir. l.* 2. *Obſ.* 144. *&* 140. *&* 147.) For hee ſpeaks of one which being put into a veſſel of water, moved it ſelf like an Hedgehog, and lived two days. It was bigger then a mans head, and ſo hard, that ſcarce could a knife cut it. In the midſt of it were three eyes, beſet round with long black hairs. He ſpeaks of another which being cut, was like an Onion, full of tunicles or membrans within one another. He writes alſo of a woman who in the ſpace of fifteen days was delivered of 152 ſmall *Mola's*, or fleſhy lumps. Now it is obſervable, that no creature is ſubject to this falſe conception but women, partly becauſe of ſin, partly by reaſon of their humid conſtitutious, idleneſſe, and moiſt food: Yet we read that Bears caſt forth their cubs unſhapen and unformed, which afterward they form by licking them. Dr. *Brown* (3. *Book c.* 6) placeth this among his *Vulgar Errors*: I confeſſe in his Book he ſhews much reading and learning, yet he might have ſpared many of thoſe which he calls Errors, and not faſten upon thoſe ancient Sages from whom we have our knowledge, more Errors then they were guilty of. For this and many more which he calls Errors, being brought to the Teſt, will be found Truths: But he is not guilty of this fault alone; ſome have ſhewed the way before him. It is then moſt certain, that the Bears ſend forth their young ones deformed and unſhaped to the ſight, by reaſon of the thick membran in which they are wrapt, which alſo is covered over with ſo mucous and flegmatick matter, which the Dam contracts in the Winter time, lying in hollow caves without motion, that to the eye it looks like an unformed lump. This mucoſity is licked away by the Dam, and the membran broken, and ſo that which before ſeemed to be informed, appears now in its

right ſhape. This is all that the Ancients meant, as appears by *Ariſtotle* (*Animal. l.6.c.31.*) who ſays, that in ſome manner, the young Bear is for a while rude, and without ſhape. Now upon this to infer, that the Ancients meant the young Bears were not at all formed or articulated, till they be licked by their Dams, is ridiculous: For who will ſay thoſe wiſe men were ſo ignorant, as to think the outward action of the tongue could perform that which could not be effected by the plaſtick and formative power in the matrix? Doubtleſſe the Ancients were no leſſe curious in ſearching into the natures of things, then we are at this day; but if I ſhould yeild that the cub is not perfectly articulated or formed, till it be excluded, no Error will arise hence; for the plaſtick faculty which hath its original from the ſperm, ceaſeth not to operate after the generation of the young animal, but continueth working ſo long as it lives: For what elſe is nutrition but a continual generation of the loſt ſubſtance, though not in whole, yet in part, and conſequently it introduceth ſtill a new form by changing the aliment into fleſh. As the ſame Maſon can build an houſe and repair it when decayed: ſo can the ſame plaſtick faculty produce the animal by generation, and repair it by nutrition. I confeſſe it is not called the *Plaſtick*, but *Omoiaſtick*, or aſſimilating faculty in nutrition, yet it is the ſame ſtill, though under different names: nay, it doth not ceaſe to produce thoſe parts after generation out of the matrix, which it could not doe within it; as may be ſeen in the production of teeth in children, even in the ſeventh year of their age, which can be nothing elſe but the effect of the formative faculty. We ſee alſo how new fleſh is generated in wounds; not to ſpeak of the nails and hairs which are produced by the ſame faculty, not being properly parts. Beſides, the faculty cannot periſh ſo long as the ſoul is in the body, being an eſſential property which cannot be ſeparated from the ſoul. Moreover, we ſee in ſome creatures, that this faculty doth not work at all in the matrix, but without: For the Chick is not formed of the Egg whileſt it is within the Hen, but when it is excluded. Hence then it appears, that if the Ancients had held the young Bears to bee ejected without form, which afterward they received by the *Plaſtick* faculty, had been no Error: and though ſome young Bears have been found perfectly formed in the womb of the Dam, it is a queſtion whether all be formed and ſhaped ſo.

CHAP.

CHAP. V.

1 *Divers priviledges of Eunuchs: The Fibers Teſticles.* 2. *Diverſities of Aliments and Medicaments, the vertue of Peaches, Mandrakes, the nature of our aliments.* 3. *A ſtrange ſtory of a ſick Maid diſcuſſed, and of ſtrange vomitings, and Monſters, and Imaginations.* 4. *Men long lived; the Deers long life aſſerted.* 5. *That old men may become young again, proved.*

THE Teſticles were made for propagation of the *Species*, not for conſervation of the *Individuum*: for Eunuchs, or ſuch as are emaſculate, have divers priviledges which others want: Firſt, they are longer lived, becauſe they have more radical moiſture, which is not waſted by Venery: Secondly, they have taller bodies for the ſame reaſon: Thirdly, they are not troubled with ſo much hair, becauſe they have not much ficcity; and conſequently not ſo much heat, which begets ficcity. Fourthly, they are not ſubject to baldneſſe, becauſe their brain is not dried with Venery as others. Fifthly, they are not afflicted with the Gout, which is the daughter of *Venus*, who begets crude humours, weakneſſe of joints, and of them the Gout: But Capons are more gouty then Cocks, becauſe they have leſſe heat, and are more voracious, ſaith *Scaliger*. Sixthly, they are fitter for ſpiritual exerciſes; therefore ſome, ſaith Chriſt, have made themſelves Eunuchs for the kingdom of Heaven; which words were miſ-conſtrued by *Origen*, ſuch as emaſculated themſelves, againſt whom are both the Canon and Civil Laws. Seventhly, they are fitter to be Councellors and Chamberlains to Princes; for they are wiſe, therefore *Eunuchs* is as much as εὐ νῶν ἔχειν, as *Scaliger* hath it, δι-νὴν ἔχειν; becauſe they had care of the Princes bed-chamber. Eightly, the fleſh of caſtrated animals is more delicate, becauſe there is in them more benigne juice, neither is their fleſh infected with the ungrateful and rankiſh reliſh of the Teſticles. Ninthly, but the greateſt priviledge of all is, that they are not infected with the venomous vapours of that cave neer *Alepo* or *Hierapolis*, which as *Dio* ſheweth in the place of *Trajan*, poiſons all creatures except Eunuchs. *Scaliger* gives no reaſon of this, nor can I, but that it is a ſecret in nature, or elſe becauſe the Eunuchs bodies have very few bad humours, are the leſſe apt to be infected with ill vapours. Tenthly, that as among men, ſo among beaſts, there be ſome which caſtrate themſelvs;

ſuch is the Fiber, called Caſtor *à caſtrando*, and the Pontick Dog, for there be ſtore of them, who makes himſelf an Eunuch, ſaith *Juvenal*.

Dr. *Brown*, (*ſect.*12.) checks the Ancients for this opinion, but without cauſe; for all agree, that they bite off the two bags, or bladders, which hang from the groin in the ſame place where the Teſticles of moſt animals are. If theſe bee the true Teſticles or not, is doubted: becauſe there is no paſſage from them to the yard, and that the true Teſticles are leſs, and lie inwards towards the back. However, this can bee no Error, becauſe they are a kinde of Teſticles, both in form and ſituation, and ſo they are called Teſticles by *Dioſcorides*, and the beſt Phyſitians: if then this be an error, it is nominal, not real.

II. As our bodies are ſtill decaying, and ſubject to many infirmities, ſo God hath provided for us all ſorts of remedies, partly, by aliments, partly, by medicaments, ſome whereof are hot, ſome cold, ſome moiſt, ſome dry, ſome reſtringent, ſome laxative, ſome diuretick, ſome hypnotick, ſome ſpermatick, ſome increaſing or diminiſhing the foure humours of our bodies, blood, choler, flegme, and melancholy.

Now thoſe aliments are called Spermatick, which either increaſe blood, for of this the Sperm is begot, or which convey the Spermatick matter to the Seminal veſſels; or which adde vigour to the languiſhing Seminall Spirits; ſuch are ſharp, biting, ſalt, aromatick and flatulent meats: or laſtly, ſuch as cauſe fecundity, by bringing the matrix and Seminall parts to a temperature by their contrary quality: So cooling things correct the heat, and hot things the coldneſſe of thoſe parts: among ſuch the Mandrakes are to be reckoned, called by *Plutarch*, *Anthropomorphoi*, and *Semihomines* by *Columella*, becauſe the forked root repreſents the lower parts of man, the upper parts are commonly carved out by circumforaneous Medacaſters. Theſe Mandrakes are of a narcotick quality; therefore a dull, heavy, or melancholick man of old was ſaid proverbially to have eaten Mandrakes: Theſe procure fecundity by correcting the hot matrix with their frigidity.

Now if we ſay, that *Rachel* finding her barrenneſſe to proceed from exceſſive heat, did cover theſe Mandrakes to cooler, and make her fruitful, this can neither be thought immodeſty in her, nor an error in us to think ſo, ſeeing the beſt and moſt Interprerers are of this opinion, and the Text ſeems to intimate ſo much.

Dr. *Browns* reasons are not sufficient to prove this a *vulgar error*, (*Book 7. c.7.*) For, 1. Though our Mandrakes have not so pleasant a smell as those of *Judea*, it will not follow they are not the same; for plants according to the climat alter their qualities; and yet *Lemnius* saith, they have a pleasant smell in *Belgium*. 2. Nor will it follow, that *Dudaim* is not Mandrakes, [because it is by the *Chaldee* Paraphrast interpreted in the *Canticles*, *Balsam*] for all Interpreters upon *Genesis*, expound the word *Mandrakes*. Nor 3. Is that sequel good [the Mandrakes did not make *Rachel* fruitful in three years after, therefore they did her no good at all in way of fecundity] for the best Physick doth not produce the wished effect always in a short space; sometimes the contumacy of the disease, sometimes the mis application, sometimes the diffusing of the remedy, sometimes bad diet, besides other things, may hinder the operation. Nor 4. Is this consequence valid [Many Simples in Scripture are differently interpreted, *Ergo*, the word *Dudaim* may not signifie Mandrakes.] I answer, they may signifie as wel as they may not; nay, they do signifie Mandrakes, as both the Hebrew, Greek, Latine, Italian, Spanish, French, English, and other Texts have it, besides the general consent of Expositors upon that place, except the *Genevans*, who would seem to be singular in this, and therefore will have the word *Dudaim* to signifie any lovely or delightful fruit; but then it may signifie Mandrakes, which are every way lovely both in smell and colour; and lovely they are in that they procure love; for they have been used for *Philters*: And what a weak reason is this, *Dudaim* signifieth any pleasant fruit, therefore it is a doubt, whether it signifieth Mandrakes? As if wee should say, *Pomum* signifies any kind of fruits, therefore it may be doubted, whether it signifieth an Apple. To be brief, I would know, whether it be a greater error in me to affirm that which is doubted by some, or in him to deny that which is affirmed by all.

But to return to our aliments, there are in them two things strange; first, that they are opposite to our natures, both privately, in that they have not our form; and positively, in that they have a contrary form; as we see in marrow, which is the aliment of the bones, the one being soft and moist, the other hard and dry; and if it were not so, there could be no action: But this is to be understood before assimilation; for afterward the same becomes both our aliment in repairing what is lost, and a part of our bodies in assuming the form

of our ſubſtance, which is no leſſe ſtrange then the other.

III. Zacuta (*de Prax. mir, l.3. Obſ.* 139.) reports a ſtrange ſtory of a Maid which fell into convulſion fits, upon the pricking of her Image by Witches, and their whiſpering of ſome magick words to it; the Phyſitians were ſent for; they ſuppoſing theſe fits to proceed from ſome malignant vapour or humour in the Matrix, gave her phyſick, which made her worſe then before; hereupon they left her, concluding that ſhe was bewitched. Afterward ſhe fell to vomiting of black ſtuffe mingled with hairs, thorns, and pins, and a lump like an egge, which being cut, was full of Emmets, which ſtunk horribly: at laſt, ſhe vomited out a black hairy creature, as big as ones fiſt, with a long tail, and in ſhape like a Rat, which ran up and down the room a while, and then died. Upon this a Wizard is called, who by whiſpering ſome words in the maids ear, and by ſhaving of her head, on which ſhe put a piece of white paper, having theſe two letters written on it, T.M. did withal lay on her head an Aſſes hoof half burned, and ſo the Maid recovered.

I obſerve here, 1. That there might be much juggling in this buſineſs; for there is no relation or ſympathy in nature between a man and his effigies, that upon the pricking of the one, the other ſhould grow ſick, no more then there is between the ſword and the wound, that the dreſſing of the one ſhould be the curing of the other. This is a fancy without ground, and yet believed by ſom whoſe faith is too prodigall. I think rather that after the Maid fell ſick, theſe Jugglers made her Image, and then pricked it, ſo that the wounding of the Image did not make the maid ſick, but her ſickneſſe made both the Image and the wounds therein.

2. This vomiting alſo might be an illuſion; for I have ſeen in *Holland* the like forgery: It was given out that a maid in *Leyden* did vomit buttons, pins, hairs, pebleſtones, and ſuch ſtuffe; and I went and ſaw the materials; but it was found out that the parents had firſt made her ſwallow theſe things in meat, and then preſently forced her to vomit all up again.

3. Theſe convulſions and vomited ſtuffe might be meerly natural, without any Witchcraft; for we have ſeen what ſtrange ſorts of vermin are bred in mans body, and voided by purging, vomiting, and boils; what unſhapen and monſtrous creatures have been produced by ſome women.

Parry tells us (*l.25. de monſtris*) of a Monſter with an horn on

on his head, two wings, a childes face, one foot onely like a birds leg, with one eye on the knee, born at *Ravenna* 1512. *Lemnius* ſpeaks of a woman that was his patient, (l. 1. *de mir.* c.8.) who firſt was delivered of an unſhapen maſſe of fleſh, having on both ſides two hands like a childs arms; and ſhortly after there fell from her a Monſter with a crooked ſnout, a long neck, fiery eyes, a ſharp tail, and mans feet, which ran up and down the room, making an horrible ſchrieching till it was killed by the women.

I could ſpeak of that *German* childe, in whoſe head grew a golden tooth, and of many other ſtrange effects of nature; but theſe may ſuffice to let us ſee all is not Witchcraft which is ſo called.

4. This imaginary cure of the Wizard was effected after the humours were ſpent, and the malignity of this diſeaſe gone; at that time a piece of paper, or a ſtraw, may doe more then all the ſons of *Æſculapius*; but had the Wizard uſed this ſpell in the beginning of the diſeaſe, it had done the maid no good at all: when nature hath maſtered a diſeaſe, that which is laſt applied, be it but a chip, carrieth away the honour of the remedy.

5. The maids imagination might be a great help towards her recovery, the force whereof is powerful both for curing and procuring of diſeaſes. *Montague* in his Eſſays (*l.* 1. *ca.* 21.) tells us of one with whom the Clyſter pipe applied to the fundament, would work as well as if he had taken the Clyſter it ſelf: And he ſpeaks of a woman, who imagining ſhe had ſwallowed a pin, as ſhe was eating a piece of bread, cried out of a great pain in her throat, and a pricking, when there was no ſuch thing but her own imagination, nor could ſhee have any reſt, till ſhe had vomited up all in her ſtomach; then ſearching the baſon, ſhe found a pin, which the Phyſitian had conveyed thither; and ſo the ſame conceit that brought the pin, removed it.

IV. In ſome Regions men live longer then in others, becauſe the aire is more temperate, the influence of the ſtars more benigne, and the food wholeſomer, by which the radical moiſture and natural heat are longer preſerved. In the Torrid and Frigid Zones men are ſhort lived, becauſe the natural heat of the body is drawn out by the ambient heat of the one, and extinguiſhed by the cold of the other: but this is where the heat and cold are in the exceſſe.

So likewiſe in the ſame Region we finde ſome men longer lived

lived then others, becauſe they abound more in radical moiſture and natural heat then others; beſides, temperance in diet, exerciſe and paſſions are great helps for prolonging of life.

In *Orkney*, *Shetland*, *Norway*, and other *Septentrional* places, men live till they be ſix or ſevenſcore years of age. And *Lerius* (*in Navigat. Braſil*) ſhews, that in *Braſil*, which is a hot countrey, ſome doe attain ſix ſcore years without gray hairs. *Pliny l.7. c.49.*) ſpeaks of divers in *Veſpaſians* time in *Italy*, of 120, 130, 140, 150 years old: and it ſtands with reaſon, that man ſhould not be ſhorter lived then other animals, being of a more excellent temper then they, having alſo dominion over them, and being made for a more excellent end., to wit, contemplation, wiſdome, knowledge, for the finding out of Arts, and Sciences: Therefore God permitted the Patriarchs before the Flood to live ſo long as they did.

Now we finde, that divers beaſts lived beyond an hundred years; *Ælian*, *Pliny*, and others affirm, that Elephants live two hundred years: Deer exceed an hundred years, as *Pliny* ſhews by thoſe Staggs that were found with Braſſe collars about their necks, which *Alexander* had put on an hundred years before.

This ſtory is rejected by Dr. *Brown*, (*Book 3. ca. 9.*) upon weak grounds: 1. [Becauſe Deer attain to their full growth at ſix years, therefore their ſtate and declination which ought to be proportionable to the growth, cannot be of long continuance. 2. Their immoderate ſalacity in the Moneth of *September*. And 3. Their loſſe of teeth between twenty and thirty, which is an infalible mark of old age.]

Theſe are feeble reaſons to deny an ancient ſtory, or matter of fact: For, 1. Nature doth not obſerve that imaginary proportion between the growth and decay of things; for ſome tame birds which attain their full growth in three or four months, have lived twenty years after: and men, who have their full growth at 25 years, have lived two or three hundred years. 2. Salacity for one moneth in the year, cannot argue a ſhort life, as it doth in Sparrows, who are ſalacious every houre; nay, almoſt every minute: For *Scaliger* obſerved a Cock-Sparrow tread the Hen ten times in a few minutes. 3. Nor is the loſſe of teeth an argument of ſhort life; for many after this loſſe have lived 60 or 70 years. And it is obſerved by *Scaliger*, that the drinking of cold water, which is an enemy to the nerves, cauſeth the falling away

of

of the teeth: therefore I will content my self with the report of *Pliny* concerning the Deers age, till I have better reasons then these.

V. It may be questioned, whether old men may becom young again; and I am of opinion they may: not that the years past can be revoked, or that which is done, undone; for *Evanders* prayer in the Poet was in vain:

O mihi præteritos referat si Jupiter annos.

But that the decayed nature may be so renewed and repaired, as an old man may perform the functions of a young man, and may say with *Tully*, *Nihil habeo quod accusem senectutem meam.* This the Poets expresse under the fiction of *Bacchus* his Nurses, and of old *Æson* made young again by *Medea.* It stands also with reason: For,

1. Serpents by casting off their old skins, renew their youth and vigour; and Stags do the like by eating Serpents, *Languescunt in juventutem, Tertul. de Pallio.* Why then may not man be renewed?

2. Every fit of sickness is like old age: men in a long Ague differ nothing from the most decrepid and aged persons that are: But being recovered, they obtain a youthful vigour and agility.

3. The radical moisture when it is much decayed, either by famine or sickness, may be again repaired, and consequently the youthful vigour of the body.

4. *David* saith, (*Psalm* 103. 5) that his youth is renewed like the Eagles. Now the Eagles, as Saint *Austin* observes on that place, when with age the upper Bill is so over-grown, that they cann t feed, they use by beating their Bill against a rock, to break off the excrescence, and so by feeding recover their strength and youth again.

5. For this end God created the Tree of Life in Paradise, that when mans radical moisture fails, it might be repaired again, and his youth be renewed by eating thereof.

6. Divers examples we have of this renovation. *Del Rio* (*de Mag. l.* 2.) sheweth out of *Torquenda*, that in the yeare 1511, was an old man at *Tarentum* of an hundred years old, who having lost his strength, hairs, nails, and colour of his skin, recovered all again, and became so young and lusty, that he lived fifty years after: Another example he brings of a *Castilian*, who suffered the same change; and of an old Abbatesse in *Valentia*, who being decrepid, suddenly became yong, her monethly courses returned, her rugged skin grew smooth,

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her gray hairs became black, and new teeth in her head.

Maſſæus in his *Indian* Hiſtory, (*lib.* 1.) ſpeaks of a certain *Indian* Prince, who lived 340 years, in which ſpace his youth was three times renewed. Beſides *Cardan*, *Langius* in his Epiſtles, (*Epiſt. med.* 79.) ſpeaks of a Well in an Iſland called *Bonica*, the waters of which being drunk, makes old men become young.

Ambroſe Parry, (*l.*24,17.) ſpeaks of a woman who being 80 years old, loſt her hair and teeth, which grew again. I have read of divers women whoſe intermitted courſes have flowed when they were 70,80,90, 100 years old.

CHAP. VI.

1. *Of many new diſeaſes, and cauſes thereof.* 2. *Different colours in our bodies: the cauſes of the Ethiopian blackneſs.* 3. *The true Unicorn with his horn and vertues aſſerted.* 4. *Some born blind and dumb, recovered: A ſtrange Univerſal Fever: A ſtrange Fiſh, and ſtrength of Imagination.*

THAT in all Ages ſome new diſeaſes have invaded mens bodies, may appear by theſe teſtimonies: *Thycides* (*l.* 2.*de Bel. Pelopon.*) ſpeaks of a new peſtilence in *Athens* never heard of there before.

Agitharchidas (*de mari rubro*) writes of the inhabitants about the red Sea, in whoſe fleſh vermin was bred like little dragons, which conſumed their fleſh; ſometimes they would thruſt out their heads, and being touched, pull them back again: they made great inflammations in the muſculous parts: This miſchief was never heard of before; one amongſt them being troubled with a *Dyſury*, voided at laſt a ſtalk of Barly: At *Athens* a youth with his urine voided a little beaſt with many feet.

Pliny tells us, that the *Mentagra*, or Tetter of the Chin and Face, was not known in *Rome* till the time of *Tiberius*: The Carbuncle came to *Rome* in the Cenſorſhip of *L. Paulus*, and *J. Marius*: The Leproſie called *Elephantiaſis*, appeared firſt in *Italy* in the time of *Pompey*; He ſpeaks alſo of other diſeaſes, which not long before his time ſprung up in *Italy*: A kind of Fever, called *Coqueluche*, by the *French*, invaded their country,

country, *anno* 1510. *England* was plagued with a new ſweating ſickneſſe, *anno* 1529: The *French* malady appeared firſt at *Naples*, *anno* 1492. The *Scorbutus* is but a new diſeaſe in thoſe parts. Many ſtrange kinds of vermin have been bred in mens bodies in this laſt Age, not known before in this part of the world: Of theſe and many more new diſeaſes *Fernelius*, *Fracoſtorius*, *Sebizius*, and others do write.

Now it is no wonder, that there are new diſeaſes, ſeeing there are new ſins. 2. New ſorts of foods and gluttony deviſed. 3. New influences of the Stars. 4. New Earthquakes and peſtiferous exhalations out of the Earth. 5. New temperaments of mens bodies. 6: Infections of waters, malignant meteors, and divers other cauſes may be alledged for new diſeaſes; but none more prevalent then the food which is converted into our ſubſtance: therefore in eating and drinking, wee ſhould regard the quantity, quality, and ſeaſons.

II. It is ſtrange to conſider the diverſitie of colours cauſed in the ſame Individual body of man by the ſame heat; the chylus, milk, ſperm, and bones, are white; the blood and liver red; the choler yellow; the melancholy green, the ſpleen blew, a part of the eye black, the hairs of divers colours, and yet none blew or green. And as ſtrange it is, that in ſome the skin is tauny, in others white, and in others black, all which is effected by one and the ſame Sun, which as it produceth all things by its heat, ſo it giveth colour to all things; for what giveth the eſſence, giveth alſo the conſequences; yet Dr. *Brown* (*Book* 6. *c.*10.) will not have the Sun to be the cauſ of the *Negro*'s blackneſſe, 1. [Becauſe the people on the South-ſide of the River *Senaga*, are black, on the other only tauny. 2. Other animals retain their own colours in that clime. 3. In *Aſia* and *America*, men are not ſo black.] I anſwer, that it will not follow, that the Sun is not the cauſe of blackneſſe; for he doth work upon each Subject according as it is diſpoſed to receive his impreſſion, and accordingly produceth diverſity of colours. Hence in the ſame hot climat men are black, Parrets and leaves of trees are green, the Emmets as ſome report, are white, the Gold is yellow, and every thing there hath its own peculiar colour, and yet all are produced by the ſame Sun; nay, the ſame man that hath a black skin, hath white teeth; the ſame Sun at the ſame time in the ſame Garden, doth cloath the Lily in white, the Roſe and Cherry in red, and divers fruits in black: it is obſerved, that

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the Sun whiteneth thoſe things which are inclined to be hard, and blackneth ſoft things; ſo he makes the *Ethiopians* teeth white, the skin black; he makes the green corn turn white and hard with his heat, and at the ſame time makes the plumb black and ſoft; women that blanch or whiten their linnen in the Sun, know that he can tan their skins, but whiten their cloth.

Again, the air may be more temperate, and greater ſtore of refreſhing windes and exhalations on the one ſide of the river *Niger*, then on the other, and ſo the Suns operation may bee hindred, which is the cauſe that in *America* and *Aſia*, under the ſame parallel, men are not ſo black as in *Africk*, where there is more heat and greater drought: For it wants thoſe freſh Winds, and great Lakes and Rivers which are in *Aſia* and *America*. The Suns heat then is the cauſe of blackneſſe in ſuch as are capable of it, whether the clime be torrid or frigid. Hence in cold countries we finde black crowes, and in hot white Swans. Beſides, this narration is ſuſpicious; for on both ſides of the River men have been ſeen equally black; and there be ſome in *Aſia* as black as in *Affrica*. He objects again, [That *Nigro*'s tranſplanted into cold countries, continue their hue, therefore the Sun is not the ſole cauſe of this blackneſſe.] *Anſ.* The queſtion is not if the Sun be the ſole cauſe, but whether a cauſe at all; which the Doctor in his former objections ſeemed to deny. 2. I ſay, that the Sun is the ſole primary cauſe; if there be any other cauſes, they are ſecondary and ſubordinate to the Suns heat and influence. 3. Hee may as well infer, the Sun is not the cauſe of greenneſſe in leaves, graſſe, or plants in the Torrid Zone, becauſe theſe being tranſplanted into cold climats, retain their hues, [*Book* 6. *c.* 12.] And indeed he ſeems to make the ſpirit of Salt peter in the Earth the cauſe of viridity, becauſe [in a glaſſe theſe ſpirits project orient greens.] I ſhould like his reaſons well, if the verdure of the plant were not more real then that of Salt-peter in the glaſſe; but what will he ſay to that Earth where is no Salt-peter at all, and yet the herbs are green? Or is there Salt-peter in a glaſſe of pure water, where I have ſeen green leaves bud out of the ſtem of an herb. Beſides, I finde urine out of which Salt-peter is made, to ſpoil the greenneſſe of the herbs. 4. If the impreſſion of black, which the Sun cauſeth in a hot clime, muſt alter in a cold, then may the other qualities alſo which the Sun by his heat procureth, be loſt in a cold countrey; and ſo what is hard in *Ethiopia*, muſt bee

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ſoft in *England*, and the heat of *Indian* ſpices muſt here grow cold. He objects again, [that there are *Negroes* under the Southern Tropick, and beyond which are colder countries.] I anſwer, that theſe *Negroes* were colonies out of hotter countries, and not Aborigines or Natives at firſt: And he confeſſeth there be Plantations of *Negroes* in *Aſia*, all which retain their original blackneſſe. Laſtly, he objecteth, [That in the parts where the *Negroes* poſſeſſe, there be rivers to moiſten the air; and in *Lybia* there are ſuch dry and ſandy deſarts, as there is no water at all, but what is brought on camels backs; and yet there are no *Negroes*; therefore drineſſe cannot cauſe blackneſſe.] I anſwer, 1. It cannot be proved, that the *Negroes* who dwell neere rivers, had their originall there. 2. Though there may be ſome moiſt exhalations, yet it ſeems they are not ſo abundant as to qualifie the Suns heat. 3. Though the deſarts of *Lybia* be dry, yet they are not ſo hot as under the Line: It is the exceſſe of heat and ſiccity together, that cauſeth blackneſſe, and not one of theſe alone. 4. We ſee men grow tauny here by converſing much in the Sun; And further South more tauny, and ſtill as the heat increaſes, the degrees of blackneſſe increaſe alſo: to deny this, were to deny our ſenſes; and we ſee dead bodies hung in the Sun, grow black; the ſame would befall to living bodies, if they continued ſtill in the Sun, yet not in ſo ſhort a time, becauſe the continuall generation of moiſture, and the ſupply of the decayed parts would make ſome reſiſtance; yet *Pauſanias* tells us, that the *Lybian* vipers are black by the Suns heat; therefore ſaith *Cardan*, there is no more reaſon why men ſhould be black there then vipers, *l.* 10. *de ſubtil.*

III. Mens bodies are obnoxious to many dangers, by reaſon of the many ſorts of poiſons in the world, ſome killing by occult, ſome by manifeſt qualities; but God out of his goodneſſe to mankind, hath ordained as many remedies and antidotes as there be poiſons, whereby their malignity is either prevented expelled: Among all theſe Antidotes, there is none more wonderful then the Unicorns horn, which hath been ſo much queſtioned and doubted by divers Writers, ſome denying the exiſtence of the Unicorn as it is ordinarily painted & deſcribed; Others denying that there is any ſuch horn, and ſome diſallowing the vertues thereof; among whom is Doctor *Brown* (*Book* 3. *c.* 23.) in his *Vulgar Errors*: But that there are Beaſts with one Horn in the *Indies*, as Bulls, Aſſes, Horſes, &c. I think none will deny. 2. The *Unicorn* or *Monoceros*, is not the

the ſame with *Rhinoceros* or *Naricorn*: for this is of an Elephantine bigneſſe, vvith ſhort legs, vvhoſe bodie is covered vvith ſhels, the Elephants enemy, which he overcame at *Lisbon*, in that publick combat exhibited by *Emanuel* of *Portugal*, *anno* 1515. he hath a ſhort Horn on his ſhoulders, another longer on his noſe; but that *Rhinoceros*, vvhoſe picture *Scaliger* ſaw, (*Exerc.* 205.) had an head like a Hog, with two horns, one upon his noſe, the other upon his forehead, called by *Martial*, (*in Amphit. Epig.*22.) *Urſus gemino cornu gravis*. But the true Unicorn hath the proportion and bigneſſe of a Horſe, the head, legs and feet of a Stragge, and the mane of an horſ; he hath a horn in his forehead, ſaith *Cardan* (*de ſubtil. l.* 10.) three cubits long; two of theſe Unicorns vvere ſeen at *Mecha*, of vvhich ſee *Parry* in his 21 Book of poiſons, *Munſter* and *Fernandus de Cordova*, [*l.* 5. *didaſ. c.* 9.] 3. The reaſon why the *Unicorn* is differently deſcribed, is, becauſe divers Authors confound him with the *Naricorn*, or elſe becauſe there be divers ſpecies of *Unicorns*, as there be of Dogs and other Animals, or elſe becauſe they vary the colour and bigneſſe of their horn according to their age and climat wherein they live, as other beaſts doe: but from variety of deſcriptions and circumſtances, we muſt not infer a nullity of the ſubſtance, as *Parry* doth; for ſo wee may deny the *Rhinoceros*, which is diverſly deſcribed; *Strabo* makes him like a Bear, [*li.* 16. *de ſub. l.*10.] *Cardan*, like a Bull, others like an Elephant. [See *Parry*, *Cardan*, *Fern. de Cord.* *Pauſanias*, *Scaliger*, *Munſter*, *Pliny*, *Solinus*, *Cæſar*, *Ælian*, *Polyhiſtor*.] Some give him but one horn, ſome two, which with ſome is crooked, with others ſtraight. I therefore make no queſtion of the true Unicorn, as he is commonly painted, becauſe *Vertomanus* ſaw two of them, as *Scaliger* witneſſeth, and ſo did *Lewis Barthema*, who as ſome ſay, is the ſame with *Vertomanus*, *Juſtin Martyr*, *Baſil*, and other of the Fathers; Yea, the holy ſcriptures ſeem to favour this deſcription, *Job* 39.9. *Will the Unicorn be willing to ſerve thee, &c?* The Hebrew word *Rem* is by *Hierom*, *Montanus*, and *Aquila*, tranſlated *Rhinoceros*; but by the 70 *Monoceros*. Yet in another place *Hierom* and *Montanus* tranſlate the word *Unicorn*: and in this place it cannot ſignifie *Rhinoceros*, becauſe this beaſt hath been oftentimes ſubdued by man, and bound, as we read in the Roman ſtories, but ſo was never the Unicorn brought into ſubjection, as God ſheweth to *Job*: And when *David* ſaith, *He ſhall be exalted like the Horn of an Unicorn*, he cannot mean the *Rhinoceros*, who

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of all cornuted Animals, hath the ſhorteſt Horn; but the true Unicorn, whoſe Horn is the higheſt of all others; for elſe *Davids* compariſon had been childiſh. Now for the Horn it ſelf, and vertues thereof, they are rejected by *Rondeletius*, *Parry*, *Brown*, and ſome others. *Rondeletius*, [*l.* 21. *de venenis*, *c.*61.] found no more vertue in this Horn then in an Elephants Tooth. *Parry* found no vertue in the French Kings Horn. *Brown* rejects the Horn, [becauſe it is diverſly deſcribed. 2. The Ancients adſcribed no vertue to it. 3. It cannot reſiſt Arſenick, and poiſons, which kill by ſecond qualities.] To theſe I anſwer, 1. If it be ſufficient to deny an Horn, for that it is differently deſcribed, we may deny the Harts Horns, for there are great differences of them, ſome bigger and higher then others, ſome more branchy, ſome harder, ſome are cloathed with a ſoft Doun, others are not; and they have not all of them exactly the ſame colour. Neither do I allow, that all which are called Unicorns horns, are true; for ſome are fictitious. 2. If the Ancients adſcribed no vertue to this horn, why was it of ſuch account among them? Why did the *Indian* Princes drink out of them, and make Cups and Rings of them, which either they wore on their fingers, or applied to their breaſts, but that they knew there was in them an antidotal vertue againſt poiſon, as *Andreth Baccius* [*l. de Unicor.*] ſheweth, and the Doctor denieth not [an Antidotall efficacy, and ſuch as the Ancients commended in this Horn] and yet two lines before, [he denies that the Ancients adſcribed any vertue to it.] But ſure it is apparent, that not only there is an occult quality in it againſt poiſon, as in the *Elks* Hoof againſt the falling ſickneſſe, but alſo by manifeſt qualities it works; for *Baccius* proves it to be of an exceſſive drying quality, and therefore good againſt worms and putrefaction. And that *Riccius* the Phyſitian did uſe ſometimes the weight of a ſcruple, ſometimes of ten grains thereof in burning fevers with good ſucceſſe. 3. That it can reſiſt Arſnick, the ſame *Baccius* proves, by the experiment which the Cardinal of *Trent* made upon two Pigeons, [*l. de Unic.*] to which he cauſed ſome Arſenick to be given: ſhortly after he gave ſom ſcrapings of his Unicorns horn to one of them, which after ſome ſymptomes recovered and lived, the other died two hours after it had eaten the Arſenick: The ſame Horn cured divers peſtilential Fevers, and ſuch as were poiſoned. Hence then it appears, that this Horn was both commended by the Ancients, namely, by *Ælian*, *Philoſtrates*, and divers others, as alſo by mo-

dern Phyſitians, as *Ficinus*, *Braſavolus*, *Matthiolus*, *Mandella*, and many more. It is true, that ſome might not find the vertue of it, either becauſe it was not the true Horn, or the true doſis was not exhibited, or due time was not obſerved, or elſe the malignancy of the diſeaſe would not yeild: For *Interdum docta plus valet arte malum.* But from hence to deny the Horn or its vertue, were all one as to deny Rhubarb, Agarick, Sena, or other Simples, becauſe they do not always produce the wiſhed effect, or work upon all bodies at all times alike. The means to diſcriminate the true Unicorns horn from the falſe, are two, to wit, if it cauſe the liquor in which it is put, to bubble; and ſecondly, if it ſweat when the poiſon is near it, as *Baccius* tells us.

IV. I have read of ſome who were born blind and dumb, and yet have been cured, [*Seidelus de morb. incur.*] but in theſe there could not be a totall privation of the organ or faculty of ſight and ſpeech; for ſuch cannot be cured by Nature nor Art. And ſo *John* 6. it was held impoſſible for one born blind to ſee. In thoſe then was only a privation of the act, and ſo the eye-lids only ſhut up and agglutinated, which by Art might be cut and opened. And ſo the ſtrings by which the tongue is tied, are often cut. I have alſo read [*in Seidelius*] of one who lived till he was an old man, and every year from his birth till his dying day, had a fever which took him ſtill upon his birth-day: This anniverſary Fever held him ſtill fourteen days, and at laſt killed him. The ſeeds of this Fever he got doubtleſſe in his mothers womb: and what impreſſions the ſeed or Embryo receiveth then, can never be eradicated; ſuch is the force of the formative power upon our firſt materials. *Scaliger* ſpeaks of a certain Fiſh in the Iſland of *Zeilam*, which if one hold faſt in his hands, puts him in a ſhaking fit of an Ague: This effect I ſuppoſe proceeds from the exceſſive cold of the Fiſh, which by the hand being communicated to the muſcles and nerves, cauſeth ſhaking and convulſion fits. And no leſſe ſtrange is that which is mentioned by *Libavius*, of one who hearing his kinſman being in a remote country, was dead of the plague, fell ſick himſelf of the ſame diſeaſe, though the place where he was then dwelling, was free from any infection. [*Libavius de veneno*, c.8. *Corollarii*] This proceeded from a deep apprehenſion, or ſudden fear, a weakneſſe in nature, and an aptitude to fall into that diſeaſe; and how powerful apprehenſion, fear and fancies are upon our bodies, may be ſeen in that ſtory mentioned

tioned by *Libavius* [*de veneno. c.*8.] of one who ate a ſnake inſtead of an Eel without any hurt, till a good while after he was told it was a Snake; and upon this he fell ſick and pined away.

CHAP. VII.

1. *The diverſities and vertues of Bezar ſtones.* 2. *A woman conceived in a Bath, of an Incubus.* 3. *Strange actions performed by ſleepers, and the cauſes thereof.* Lots *Inceſt in his ſleep.* 4. *Some Animals live long without food: The Camelions food is only air; the contrary reaſons anſwered: Air turns to water, and is the pabulous ſupply of fire.*

MOnardes [*in hiſtoria* Bezoaris] ſpeaks of ſome who were poiſoned by drinking out of a puddle where Toads, Snakes, and other virulent vermin had laid their ſpawn, but were cured by taking Bezar two or three times. *Bauhinus* [*c.* 34.36.] ſpeaks of divers diſeaſes cured by this ſtone; and it is known by daily experience, that it is uſed with good ſucceſſe in peſtilential Fevers, as *Synertus* ſhews, *Syn.l.*4. *de Feb.c.*8. It is alſo good in divers other maladies both to cure and prevent them: Yet Doctor *Brown* thinks [*we are daily gulled in the Bezar, whereof many are falſe, Book* 3. *c.* 23.] I deny not but ſome adulterat Bezars there are, yet we muſt not think all falſ, or that we are gulled, becauſe we do not ſee the wiſhed effects: For *Synertus* (*l.*4. *de Feb. c.*8.) ſhews, that the beſt Bezar faileth, if the juſt doſe be not given. For ſome out of fearfulneſs give but a grain or two, whereas he hath given eight or ten grains with good ſucceſſe. Again, the operation of it is hindred oftentimes by mixing it with other Simples: It proves alſo ineffectual, if any thing elſe be given too ſoon after, or if the ſtomach be not clear when it is exhibited. For as the ſpirit of Tartar and Vitriol by themſelves will work powerfully; but being mixed, loſe their operative qualities and taſte: ſo doth Bezar many times mixed with other things. Now this ſtone is bred in a bag under the ſtomach of ſome beaſts, which in form reſemble our Goats: In the *Eaſt-Indies* they have horns, but in the *Weſt* none: The Oriental ſtones are the beſt, a grain whereof hath been ſold for four Ducats. Some of them are as big as a Gooſe Egg: they have divers forms, and divers co-

lours, ſome yellow, ſome green, ſome black; the beſt are bred in thoſe beaſts that feed on the hils, and on aromatick hearbs, which are not found in the valleys: they grow like Onions wrapt about with many tunicles or cruſts. *Acoſta* (*l.* 4. *c.* 42.) ſheweth, that in the midſt of ſome of them are found pins, ſtraws, or ſticks, about which matter doth gather, vvhich by degrees increaſeth and hardneth till it come to a juſt magnitude. In the midſt of thoſe ſtones are found ſometimes odoriferous hearbs. *Mathiolus* and *Renodæus* hold thoſe for the beſt ſtones in the midſt of which are found duſt or gravel. The *Indians* uſe the pouder of Bezar, not only againſt inward diſeaſes, but alſo with it they cure their wounds and Carbuncles, or Boils. *Acoſta* (*l.* 4. *c.* 42.) relates the obſervation of the *Peruans*, vvho ſay, that the beſt ſtone is bred in a beaſt called *Vieugne*, vvhich feeds upon a poiſonable hearb, by which it preſerves it ſelf from the graſſe, and vvaters that are poiſoned by venomous beaſts. He that will ſee more of this ſtone, let him read thoſe above named, and likewiſe *Boutius*, *Baccius*, *Toll*, and others.

II. That ſtory is ſtrange of the Woman vvhich conceived in a Bath by attracting the mans ſperm who bathed in the ſame place: This is affirmed by *Averroes* (*Anat. l.* 8. *quæſt.* 11.) but denied by *Laurentius*, *del Rio*, and ſome others, vvhom Doctor *Brown* in this followeth. Hee that denyeth a matter of fact, muſt bring good witneſſes to the contrary, or elſe ſhew the impoſſibility of the fact, which they do not. For we ſhall find this conception poſſible, if either we conſider the nature of the Matrix, vvhich by a ſtrange inſtinct and appetite attracteth the ſperm to it (for which cauſe *Plato* calls it (ζῶον ἐπιθυμητικὸν) even as the ſtomach attracteth meat and drink, though in ſome diſtance from it: Or if wee conſider that the ſeminal ſpirits in the vvarm vvater might be a vvhile preſerved from evaporating; and therefore what they ſay of the longitude of the organ in which the ſeed is refrigerated, is not to the purpoſe, except they could prove it to be ſo in all: But the contrary is found in the long organ of great breaſts, wherein the ſperm is no vvays damaged. Beſides, the heat of the bath might have ſome proportion to that of the Matrix; vvhereas the organ of emiſſion is not ſo hot, as conſiſting moſt of nervous and ſpermatical parts. Again, vve ſee that the ſperm of Fiſhes, in vvhich there are ſeminal ſpirits, is not prejudiced by the vvater vvhere it is ſhed; but the male fiſhes caſt their ſeed upon the ſpawn vvhich the females leave in the vvater, as

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Aristotle, *Pliny*, *Ælian*, *Albertus* and others, do shew. Lastly, wee must not think all the stories false which are written of the *Incubi*, which were evil spirits conveying the masculine seed to the place of generation, of which there have been conceptions. For to deny this, saith *Augustine*, (*lib.* 15. *de Civit. Dei*, *cap.*23.) doth argue impudence, considering the many testimonies and examples of the same: yet I deny not but the imagination is sometimes deluded, but not still, as *Wierus* thinks; and I know also, that *Incubus* is the same disease with *Ephialtes*; yet it will not follow, that there are no evill spirits called *Incubi* and *Succubi*: For, to deny such, were to accuse the ancient Doctors of the Church, and the Ecclesiastick Histories of falshood, which affirm that the *Catechumeni* were much troubled with these *Incubi*. This were also to contradict the common consent of all Nations, and experience. There is then a double *Incubus*, the one natural, called ἐφιάλτης, which is caused in sleep by a frigid grosse vapour filling the ventricles of the brain, and prohibiting the animall spirits to passe through the nerves, whereby the imagination is hurt, so that they think they are oppressed with a great weight. This disease is much like the *Epilepsia*, but somwhat milde. The other *Incubus* is Diabolical.

III. That some men can in their sleep perform those actions which they neither could nor durst do when awaked, is known by Histories and experience. *Marianus* (*cap. ad audientiam*) witnesseth, that he had a Maid, who in her sleep could rise and make bread, as if she had been awaked. *Francis Mendoza*, (*l.*6. *de Flor.*) knew one who would rise in his sleep, and in the night time walked out with his naked sword, with which hee struck some of the City guard; but at last being wounded, was awaked. *Tirannel* (*in Mendoza*) speaks of an *English* man in *Paris*, who rose in his sleep, went down towards the river *Sene*; where, having met with a Boy, he killed him, and so returned (being all this while asleep) to his bed. *Horstius* (*de noctambulis*) writes of one who in his sleep usually would arise, go up and down the stairs, lock and unlock his chests. He speaks of another, who dreamed he was to ride a Journy, riseth, puts on his cloaths, boots and spurs, gets up into the Window, where he sate straddling, beating the wals with his spurs, till hee was awaked. And he sheweth, that at *Helmstad* one rose in his sleep, went down the stairs into a Court; from thence toward the Kitchin, neer which was a deep Wel: into this he went down, holding fast to the stones by his hands

and feet; but when hee touched the vvater, with the cold thereof he vvas awaked; and finding in what danger he was, gave a pitiful out-cry, which awaked thoſe in the houſe, who having found him, got him out, and brought him to his bed, where he lay many days ſpeechleſſe and immoveable, being extreamly weakned with fear, cold, and crying. Another ſtory he hath no leſſe ſtrange then this, of a young Gentleman vvho in his ſleep aroſe naked, carrying his ſhirt in his hand, and by the help of a rope clambers up to a high Turret in the Caſtle where he then was: Here he findes a neſt of Mag-pies, which he robs, and puts the young ones in his ſhirt; and ſo by the ſame rope comes down again, and returns to his bed: The next morning being awaked, tells his brother how he dreamed that he had robb'd a Pies neſt; and withal wondring what was become of his ſhirt, riſeth and findes it at his beds feet, with the young birds wrapt up in it. To theſe examples, wee may add that of *Lot*, who in his ſleep begot his two daughters with childe: This Dr. *Brown* (*Book 7. c. 6.*) will not admit, though he hath a direct Text of Scripture againſt him: For there it is ſaid, *Gen. 19. That Lot neither knew when his daughters lay down, nor when they roſe up.* Which words are expounded by *Irenæus* (*c. 51. cont. Hæreſ.*) *That* Lot *had neither pleaſure, nor conſent, nor ſenſe, nor knowledge of this act*: *Chryſoſtome* affirms the ſame, expounding theſe words, *Lot* (ſaith he, *Hom. 44. in Geneſ.*) *was ſo intoxicated with wine, that he knew not at all what he did, leſt he ſhould be guilty of ſo great a crime; acting in this neither wittingly nor willingly.* S. *Auſtin* is of the ſame minde, (*Cont. manic. l. 22.*) and other Expoſitors. Now if one ask, how ſleeping men can do ſuch things? I anſwer, it is partly by the ſtrength of imagination, which is more active in ſleep then when we are awake. 2. All ſleepers are not apt for ſuch actions; but ſuch whoſe natures are melancholy or cholerick, whoſe ſpirits are more fervent, ſubtil, and agile then others, moving the muſcles, and by them the body, though the outward ſenſes be bound up by ſleep. 3. They catch not that hurt in their ſleep, which they would do if awaked; becauſe their ſenſes are not avocated by other objects, they have no apprehenſion of fear, their imagination is more intent in ſleep; and withal their Genius or good Angel is carefull of them.

IV. I read of divers both beaſts and men, which have lived a long time without meat or drink: We know that Swallows, Cuckows, Dormice, & diuers other animals, faſt all the Winter:

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The like is recorded of Lizards, Serpents, Water-Crocodiles, Bears, and other ravenous beaſts, whoſe bodies by reaſon of their humidity and rapacity, are full of crudities, by which they are fed in the Winter. *Mendoſa* (*de Flor. Philoſ. Probl.* 24.) ſpeaks of a Hen in his time, which lived eighty dayes without food and vvater. *Cardan* (*de ſubtil. l.* 10.) writes, that the *Indian* bird called *Manucodiata*, lives only in the aire upon dew as Graſhoppers do. *Rondiletius* (*l.* 1. *de Piſcib. c.* 12.) ſhews, that his wife kept a fiſh three years in a glaſſe, without any other food but water; and yet the fiſh grew ſo big, that the glaſſe could not at laſt contain it. And I have kept Spiders my ſelf in a glaſſe, which I diſmiſſed after they had faſted nine months. The Camelion alſo liveth upon the air, *Oſcitans veſcitur, follicans ruminat, de vento cibus*, ſaith *Tertullian* (*in Pallio.*) I have ſeen a Camelion which was brought hither from *Africa* by ſea, and kept in a box, which all the while was never ſeen to feed on any thing elſe but air. Yet D. *Brown* (*Book* 3, *c.* 21.) will not have air to be his food for theſe reaſons: 1. *Becauſe* Ariſtotle *and* Ælian *ſpeak nothing of this. Anſ.* Neither do they ſpeak any thing againſt it, which likely they would have done, if they had thought their feeding on aire had been fabulous. They do not ſpeak of what food each animal is ſuſtained: and though they doe not ſpeak of this airy food, yet *Pliny*, and others do. 2. Scaliger *writes, that* Claudius *ſaw a Camelion lick up a fly from his breaſt.* And *Bellonius upon exenteration found flies in the Camelions belly. Anſw.* So I have ſeen Dogs and Cats eat Flies; Monkies and Turkies eat Spiders, and Dogs eat graſſe; yet it will not follow, that they feed on theſe, but rather eat them out of wantonneſſe, or for phyſick; ſo doth the Camelion ſometimes eat flies; and ſo doth the Oſtridge eat Iron, and divers birds ſwallow ſtones. 3. *There are found in this animal the guts, the ſtomach, and other parts for nutrition, which had been ſuperfluous if it feed on aire only. Anſw.* Theſe parts are not ſuperfluous, though they feed on air, but neceſſary; becauſe the air on which they feed, is not pure, but mixed, and therefore nutritive. Again, they vvere to eat ſometimes flies, for pleaſure or phyſick, therefore the ſtomach was neceſſary. Moreover, we muſt not think every thing in nature ſuperfluous, whereof vvee can give no reaſon; for ſo wee may accuſe her for giving eyes to Wonts, tears to Men, Goats, and Dogs, whereof they make no uſe. And why ſhe is ſo bountiful to the Fox, and ſo niggardly to the Ape, in giving the one too great a tail, the other none at

all. 4. He reaſons *From the bigneſſe of the Camelions tongue, and the ſlimy matter in it, that air cannot be its nutriment. Anſw.* Its tongue vvas made to catch flies, but not for nutriment, as is ſaid: and that ſlimy matter is given as well for its prey, as for the deſtruction of Serpents its enemies: for it uſeth upon the ſight of a Serpent, to let fall that ſlimy matter on his head, vvith which he is preſently killed. 5. *The air cannot nouriſh, becauſe it hath no taſte. Anſ.* Taſt belongs not to nouriſhment; for they who have loſt their taſt, are not therefore the leſſe nouriſhed. Again, though the pure air be taſtleſſe, yet air thickned and moiſtned, is not ſo as we may perceive by the divers taſts in waters. Beſides, though the air be taſtleſſe to us, it may be otherwiſe to the Camelion. 6. *There can be no tranſmutation of air into the body nouriſhed, becauſe there is no familiarity of matter between air and a living body. Anſ.* This may be true of pure air, but not of mixed, and of our bodies, not of the Camelions. Beſides, divers creatures live on dew, which is but watriſh air; and how many in *Arabia* are fed with Manna, vvhich is both begot of and in the air. 7. *Nutriment is condenſated by the natural heat, but air by the bodies heat is rarified. Anſ.* The contrary of this is ſeen continually by the air vve breath out, which is ſtill thicker then that we take in: For though the heat doth rarifie the air, yet by the moiſture of our bodies it is thickned. 8. *All aliment muſt remain ſome time in the body; but air is preſently expelled. Anſw.* The air which is attracted by the Lungs, and ſerves for refrigeration of the heart, is quickly again expelled, becauſe it is to ſtay no longer then it performs its office, vvhich is to refrigerate; but that air on which the Camelion and other creatures feed, muſt and doth ſtay longer. 9. *Air in regard of our natural heat, is cold, and ſo contrary; but aliment is potentially the ſame. Anſ.* All aliment is contrary at firſt, or elſe there could bee no action, and ſo no nutrition. Again, vvhat is cold, is potentially the ſame vvith our bodies, in reſpect of the ſubſtance, not of the quality. Beſides, how many ſorts of cold meats, fiſh, fruits, hearbs, ſallets, do men eat in Summer, vvhich notwithſtanding are the ſame potentially with their bodies. 10. *Some deny air to be an aliment, or that it entreth into mixt bodies, and its not eaſie to demonſtrate, that it is convertible into water; and we doubt that air is the pabulous ſupply of fire, much leſſe that flame is properly air kindled. Anſ.* Some have denyed Snow to be white, or fire hot, therefore no wonder if ſome fantaſtical heads deny air to be an element, or that it entreth into mixt bodies. *Danæus* indeed thinks air and water to be all one, becauſe water is quick-

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ly turned into air,and becauſe they have great affinity: but this is againſt himſelf; for what can be turned into another ſubſtance is not the ſame, nothing is convertible into it ſelf: and if air be vvater,becauſe this can be turned into that, then vvater is earth; for in many caves vvater drops turn to ſtones, and ſo we ſhall make but one element. Again, if air enter not into mixt bodies, what is that unctuous humidity or oyl which we finde in all perfect mixt bodies? It cannot be fire nor earth; for theſe are neither unctuous nor humid: nor can it be water; for though that be humid,it is not unctuons, it muſt needs then be air. Again,when the Doctor ſaith, *It is not eaſie to demonſtrate the converſion of air into water*; he denieth both ſenſe and reaſon: for this converſion is as demonſtrable as our reſpiration in winter, when the air which a man attracteth, is turned into water drops on his beard,ſheets,rugs,and blankets: reaſon alſo ſhews this; for if water can be turned into air, why cannot air be turned into water,both communicating in the ſymbolical quality of humidity. Laſtly, his doubting, and the Lord *Verulams* denying air to be the pabulous ſupply of fire,is cauſleſs: For I ask, what is it that ſubſtantially maintains the fire? They anſwer, *It is combuſtible matter in the kindled body*. But in this they trifle: for I ask what this combuſtible matter is? Earth it cannot be; for earth, 1. as earth, is not combuſtible;and we ſee that after the fire is ſpent, earth remains in aſhes. Nor can it be water; for that maintains not the fire, but extinguiſheth it. It muſt then neceſſarily be air: for we ſee by daily experience, that the more of this unctuous or aereal humidity is in the fewel,the more apt it is to burn. And when this is ſpent,the fire dieth,as we ſee in candles,lamps,torches,links,and whatſoever hath pinguedinous matter in it. *Fernelius* indeed gives a threefold food to the fire; to wit,combuſtible ſtuffe,ſmoak,and air; but all this may be reduced to air: For nothing is combuſtible, which hath not in it aereal humidity: and ſmoak is nothing elſe but air cloathed with the fiery quality of ſiccity and calidity, wanting nothing but light to make it fire. Therefore we ſee how quickly ſmoak is turned into flame, and this into ſmoak again. To conclude,air is the very life of fire,which would quickly die,if it received not animation by ventilation. This we ſee in cupping-glaſſes, how nimbly the fire, when almoſt extinguiſhed, will upon a little vent ſuck the air to it.

CHAP.

CHAP. VIII.

1. *Divers animals long-lived without food. The Camelion live, on air only.* 2. *Divers creatures fed only by water.* 3. *Chilification not absolutely necessary. Strange operations of some stomachs. The Ostrich eats and digests Iron.* 4. *How Bees, Gnats, &c. make a sound. Of Glow-worms: and Grains bit by Pismires: the vegitable Lamb, and other strange plants.* 5. *The Tygers swiftnesse. The Remora stays ships.*

THAT divers animals, even men and women. can subsist without food, is plain by these examples: A certain maid in the Diocesse of *Spire*, *anno* 1542. lived three years without meat or drink. In the year 1582. in the Palatinat there lived a maid nine years together without food, who afterward married, and had children. *Rondeletius* (*l.* 1. *de pis.* c. 13.) writes of a maid in *France*, and of another in *Germany*, who lived divers years without food: and of another whom hee saw that had no other food but air ten years together. *Ficinus* saw a man who had no other food but what the air and Sun afforded him. In the year 1595. a maid lived at *Colen* three years without food; another at *Bern* lived eighteen years on the air alone, *anno* 1604. Other examples I could alledge out of *Citesius* Physitian of *Padua*, *Lentulus* of *Bern*, *Joubertus*, and others; but these may suffice to let us see, that nutrition doth not consist meerly in meat and drink. I will not here alledge examples of miraculous fasts, or of Diabolical and Magical; but such as are meerly natural, as these which I have named: for in them the natural heat was weak, and not able to master the humidity with which they abounded: So then, where there is a weak heat, and much sweet phlegm, which is imperfect blood, as Physitians call it, there the life may bee prolonged without food.

I have read (*Mendoza in Flor. phil.*) of a *Venetian* who fasted forty six years, being of a cold constitution, and abounding with thick phlegme; we see this in the hearb *Semper-vivum*, which many years together liveth, and is green without earth or water, having much natural humidity within it. So the Camelion is onely fed by air, as is said, which appears to be true (however Dr. *Brown* (*Book* 3. *c.*21.) writes to the contrary) by these reasons, 1. The testimonies both of ancient and modern Writers, except a few, and the witnesses of

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ſome yet living, who have kept Camelions a long time, and never ſaw them feed but on air. 2. To what end hath Nature given it ſuch large Lungs beyond its proportion? Snre not for refrigeration; leſſe Lungs would ſerve for this uſe, ſeeing their heat is weak; it muſt be then for nutrition. 3. There is ſo little blood in it, that we may eaſily ſee it doth not feed on ſolid meat.

The Doctor ſaith, *That Frogs and divers Fiſhes have little blood, and yet their nutriment is ſolid.* But he doth not prove the nutriment to be ſolid. Beſides, they have more blood then is in the Camelion. 4. To what end ſhould it contnually gape more then other animals, but that it ſtands more in need of air then they, to wit, for nutrition as well as refrigeration. The Doctor imputeth this gaping to the largeneſſe of his Lungs: This is but a ſhift; for other animals whoſe Lungs doe exceed both the Lungs and whole bodies of many Camelions, do not gape as this doth, and yet they ſtand more in need of refrigeration, as having more blood and heat, then ten thouſand Camelions. 5. He that kept the Camelion which I ſaw, never perceived it to void excrements backwards; an argument it had no ſolid food: and what wonder is it for the Camelion to live on air, when *Hay* a beaſt of *Braſil*, as big as a Dog, was never ſeen to feed on any thing elſe, as *Lerius* witneſſeth? The Doctor concludes, *That the Camelion is abſtenious a long time, but not ſtill, becauſe divers other animals are ſo.* He may as well infer, that the Camelion is cornuted, becauſe divers other animals are ſo. Each ſpecies hath its property, which is not communicable to other ſpecies; otherwiſe it were no property.

II. That water is the aliment of divers creatures, is plain; 1. By the vegetables; for herbs, trees, and plants are nouriſhed by it. 2. By animals; for it is the food of many fiſhes, as was ſhewed by that fiſh which *Rondeletius* his wife kept three years in a glaſſe. Graſhoppers feed upon dew, which is water.

I have read (*Mendoza, Prob.* 23.) of Worms in *Armenia*, which feed only on Snow; and of ſome birds whoſe aliment is only water. 3. By men; for *Albertus Magnus* ſpeaks of one who lived ſeven weeks together only upon water. I know *Ariſtotle*, (*l.* 7. *de anim.*) *Galen*, and *Averroes* are againſt this opinion. But we muſt underſtand they ſpeak of the pure element of water, which is not nutritive; not of that which is impure, mixed, or compounded; for ſuch may nouriſh.

Doctor *Brown* will not have water an aliment, 1. *Becauſe*

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ſome creatures drink not at all. *Anſw.* To ſuch, water indeed can be no aliment, and ſo indeed his argument is good; but to ſay, that water is no creatures aliment, becauſe ſome creatures do not drink at all, is as much as if he ſhould infer, that no man eats bread, becauſe ſome men never ate any. 2. He ſaith, T*hat water ſerves for refrigeration and dilution; therefore it is no aliment.* *Anſw.* Why may not the ſame thing ſerve both? Doe we not many times eat cooling hearbs, which both refrigerate and feed us. 3. *If the ancients* (ſaith he) *had thought water nutritive, they would not have commended the Limpid water for the beſt, but rather turbid ſtreams, where there may be ſome nutriment.* *Anſw.* If the Ancients had ſpoken of Waters fitteſt to feed Eels, Frogs, and ſuch as live on mud, they would have commended the turbid ſtreams; but they ſpake of ſuch Waters as are fitteſt for our bodies, and therefore they commended the Limpid for the beſt; and yet he confeſſeth in the pureſt water there is much terreous reſidence, and conſequently ſome nutriment.

III. Chilification is an action of the ſtomach, but not abſolutely neceſſary, becauſe many creatures in the Winter live without it: And this act is not to be aſcribed to the heat of the ſtomach; for though heat as heat doth concoct, yet it doth not chilifie; for neither fiery, nor feveriſh, nor any other heat of the body can perform this, but that of the ſtomach; therefore this action muſt proceed from the ſpecifical form and proper quality of the ſtomach, which turns all it receives into a white creamy ſubſtance, but cannot produce ſeveral ſubſtances, as the Liver doth; becauſe it is not ſo hot as the Liver, or rather it hath not that ſpecifical form which the Liver hath. Beſides, that the ſtomachs work is to maſter the aliment, to concoct it, and to prepare it for the Liver. But beſides this quality of the ſtomach, there is another more ſtrange, when ſom can eat and digeſt coals, ſand, lime, pitch, aſhes, and ſuch like traſh. This is called by Phyſitians a diſeaſe, under the name of *Pica*, *Citta*, *Malacia*; but I think it proceeds not only from a diſtemper in the ſtomach, and malignant acide humors impacted in the membrans thereof; but alſo, and that chiefly, from ſome occult quality. *Foreſtus* (*lib.* 18. *Obſ.* 7.) knew one who ſwallowed down live Eeels, another who ate a piece of Lime as big as his fiſt, and all without hurt. *Fonſeca* (*Conſult. part.* 1. *conſ.* 94.) knew a woman who daily did eat earthen ware or pot-ſheards ſo long as ſhe lived; and ſhe lived till ſhe was old; even when ſhe fell ſick of a fever, ſhe could not abſtain

ſtain from eating of this ſtuffe: therefore I do not much wonder that the Oſtridge can eat and digeſt iron, which it doth not by its heat, as *Cardan* thinks; (though I deny not but the great heat of that bird, and the thickneſſe of his Gizzard may be ſome help) but rather by an occult quality, or the nature of its whole eſſence, as *Fernelius* writes: For the truth of this, we have not only the teſtimonies of the Ancients, but the experiments alſo of late Writers: For *Langius* in his Epiſtles, writes that he ſaw ſome of thoſe Oſtriches in the Duke of *Ferrara*'s Garden, who ſwallowed and digeſted pieces of gold, and other metal. *Leo Africanus* ſaith, that they ſwallow whatſoever they finde, even iron. And what wonder is it if the Oſtrich eat Iron, when Rats do the ſame. But Doctor *Brown* denies this for theſe reaſons, (*book* 3. *c.* 22.) Becauſe *Ariſtotle* and *Oppian* are ſilent in this ſingularity. 2. *Pliny* ſpeaketh of its wonderful digeſtion. 3. *Ælian* mentions not Iron. 4. *Leo Africanus* ſpeaks diminutively. 5. *Fernelius* extenuates it, and *Riolanus* denies it. 6. *Albertus Magnus* refutes it. 7. *Aldrovandus* ſaw an Oſtrich ſwallow Iron, which excluded it again undigeſted. *Anſw. Ariſtotles*, *Oppians*, and *Ælians* ſilence, are of no force; for arguments taken from a negative authority, were never held of any validity. Many things are omitted by them, which yet are true; It is ſufficient that we have eye-witneſſes to confirm this truth. As for *Pliny*, he ſaith plainly, that it concocteth whatſoever it eateth. Now the Doctor acknowledgeth it eats Iron: *Ergo*, according to *Pliny*, it concocts Iron. *Africanus* tells us, that it devours Iron. And *Fernelius* is ſo far from extenuating the matter, that he plainly affirms it, and ſhews, that this concoction is performed by the nature of its whole eſſence. As for *Riolanus*, his denial without ground, we regard not. *Albertus Magnus* ſpeaks not of iron, but of ſtones which it ſwallows, and excludes again without nutriment. As for *Aldrovandus*, I deny not but he might ſee one Oſtrich which excluded his iron undigeſted; but one Swallow makes no Summer. All individuals have not the ſame temperament: Among men, ſome will digeſt that which others cannot: there might be ſome weakneſſe or diſtemper in the ſtomach of that Oſtrich. Again, digeſtion or concoction (if we ſpeak of the firſt which is the work of the ſtomach) is nothing elſe but the altering of the aliment, not into a new ſubſtance, (for that is done by the Liver) but into a new quality, in which the natural heat ſeparates the excrements from that which is fit for nutrition: If ſo,

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then the Iron which this Oſtrich excluded, was digeſted; for the ſtomach ſuckt ſomething out of it, and altered that which was fit for nutriment, ſending away the ſuperfluous part: Thus the Iron was not undigeſted, becauſe egeſted: For of every thing we eat, there is ſome part excluded. Now the Doctor cannot deny, but that the Iron receiveth an alteration in the ſtomach; and what I pray is this but chilification? Yet hee will not have this alteration to proceed from the power of natural heat; but from an acide and vitriolous humidity (if there were ſuch a manifeſt quality, or a vitriolous humidity to corrode the Iron, it would doubtleſſe corrode the ſtomach it ſelf; therefore the ſafeſt way is to acknowledge an occult quality.

Again, if the Doctor will ſpeak Philoſophically, the principal agent in digeſtion is heat, not moiſture; for humidity compared to calidity, is a paſſive quality; ſo then the vitriol corrodes by its heat, not by its moiſture.

IV. When I fell upon this piece, I thought not to meddle with Doctor *Browns* Enquiries: but finding ſome of his Aſſertions contradictory to what I was to write, I thought good to bring ſome of them to the Teſt, and to remove all rubbiſh out of my way; wherein I hope I ſhall doe him no wrong, ſeeing as he ſaith in his Epiſtle, *Opinions are free, and open it is for any to think or declare the contrary.* Having therefore examined ſome of his Aſſertions, I will be bold to enquire into ſome more of his Enquiries, having no intent to traduce or extenuate his excellent pains, but to elucidate what may ſeem to be obſcure, and to deliver my opinion wherein I think he is miſtaken. Whereas then he ſaith out of *Ariſtotle*, *That Flies, Bees, &c. make a ſound by the alliſion of an inward ſpirit, upon a little membrane of the body.* I will not deny but this may be in ſome, but not in all: for I have obſerved the contrary in Gnats, whoſe ſound is made by their wings only; when I pluckt off one wing, they ſounded with the other; but when they loſt both, they made no ſound at all. Again, when he ſaith, *That the light of the Glow-worm depends upon a living ſpirit*, he expreſſeth but a remote cauſe: for the proximat and immediat cauſe is the natural heat in a clear luminous water or humour: For I have obſerved in thoſe I kept ſome days in graſſe, that as this heat decreaſed, the humour thickned, and as it were congealed, & ſo the light grew dimmer; being quite dead, there remained the congealed humour, white like a piece of chalk. Thoſe I took were for three or four nights

nights, ſo ſhining, that holding the book neer, I could ſee to read by them. Again he ſaith, *That grains whoſe ends are cut off, will ſuddenly ſprout; which thwarts their opinion, who ſay, that the Piſmires bite off the end of the corn, which they ſtore up to prevent the growth thereof.* Both theſe Aſſertions may bee true: For corn cut at the ends, may grow, and yet that may faile which the Piſmire bites; becauſe of ſome malignant quality contrary to the grain, impreſſed upon it by the Piſmires bite, which is not in the knife. Again, he ſaith, (*Book* 3. c.27.) *That the plant animal, or vegitable Lamb of* Tartaria, *is not much to be wondred at, if it be no more then the ſhape of a lamb in the flower or ſeed.* Sure it muſt be more then this, if thoſe that write the ſtory thereof deceive us not. For *Scaliger* (*Exerc.*182.29.) deſcribes it out of them to be like a Lamb in all the parts of it: in ſtead of horns, it hath long hairs like horns, it is covered with a thin skin, it bleeds when it is wounded, and lives ſo long as it hath graſs to feed on; whenthat is ſpent, it dieth. And they write alſo, that it is a prey to Wolves. All theſe circumſtances may be true: For 1. the ſhape, why may not this plant reſemble a Lamb, as well as that *Indian* fruit deſcribed by *Nic. Monardes*, reſembles a Dragon ſo artificially painted by nature, as if it were done by a painter. 2. Why may it not have a Downy, or Woolly skin, as well as Peaches, Quinces, Cheſnuts, and other fruits which are covered with a Down, called *Lanugo* by the Poet? 3. Why may it not bleed as well as that Tree we mentioned but now, called *Draco*, from the ſhape of the Dragon which its fruit hath; the juice of this Tree from the reſemblance is called the blood of the Dragon, well known in Phyſick for its aſtringent and corroborating quality. 4. Why may it not have ſome animal motions, as well as that plant called *Pudica*, which contracts it leaves when you touch or come neer it, and dilates them again when you depart? Or that Tree in the Iſle of *Cimbubon*, whoſe leaves falling on the ground, crawl up and down like Worms: they have (ſaith *Scaliger*, *Exerc.*112.) two little feet on each ſide: if they be touched, they run away. One of theſe leaves was kept alive eight days in a platter, which ſtill moved it ſelfe when it was touched.

V. That Tigers are ſwift creatures, is affirmed by all the Ancients; but denyed by *Bontius*, *Becauſe* (as the Doctor cites him) *thoſe in Java are ſlow and tardigradous.* By the ſame reaſon he may infer, that our ſheep are as big as Aſſes, and doe carry burthens, becauſe the ſheep of *America* are ſuch; or that the

the *African* Lions are not fierce, big, and red, as they are deſcribed; becauſe the *American* are not ſo; for the *Indian* animals differ much from ours, although they be the ſame ſpecies. Though then the *Indian* Tygers be ſlow, the *African* or *European* may be ſwift. Again, the Doctor doubts, *that the ſtory of the Remora may be unreaſonably amplified.* The ſtory is, that it ſtays ſhips under ſail: This, ſaith *Scaliger*, is as poſſible as for the Loadſtone to draw Iron: for neither the reſting of the one, nor moving of the other, proceeds from an apparent, but from an occult vertue: for as in the one there is an hid principle of motion, ſo there is in the other a ſecret principle of quieſcence.

CHAP. IX.

1. *Lions afraid of Cocks: Antipathies cauſe fear and horror in divers animals.* 2. *Spiders kill Toads; the diverſities of Spiders.* 3. *The Cocks Egge and Baſilisk: Divers ſorts of Baſilisks.* 4. *Amphisbæna proved, and the contrary objections anſwered.* 5. *The Vipers generation by the death of the mother proved, and objections to the contrary refuted.*

THat the Lion is afraid of the Cock, is doubted by the Doctor, (*book* 3. *c.*24.) *becauſe* Camerarius *ſpeaks of one lion that leapt down into a yard where were Cocks and Hens, which he ate up.* But the ſame *Camerarius* (*Medit. part.*1. *c.* 12.) in the ſame alledged place, ſheweth, that this fear of the Lion is juſtified both by experience, and many eye-witneſſes. And ſurely this is no more improbable then for a Lion to be afraid at the ſight of a fire, or for an Elephant to be afraid at the ſight of a Hog; which the *Romans* knew, when they drove an Herd of Swine among the Enemies Elephants, by which means they got the Victory of *Pyrrhus.* So much afraid is the Elephant of an Hog, that if he hear him gruntle, he will run away. And who would think that a Monky ſhould be afraid and ſhake at the ſight of a Snail, that *Eraſmus* (*in amicitia*) tels us, he ſaw one which at the ſight of a Snail was ſo affrighted, that he fell to vomiting ſo, as the owner could ſcarce keep him alive. Who can give a reaſon, why the ſcratching upon braſſe, or other hard metals, ſhould diſtemper the teeth; and

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in ſome men force urine? Why are ſome men whom I know, affrighted at the ſight of a Toad; nay, of a Frog? There is among Horſes in the ſame ſtable, among oxen in the ſame ſtall, among children in the ſame ſchool, an antipathy: It is no wonder then, that ſo magnanimous a creature as the Lion ſhould be afraid at the ſight of a Cock, when the couragious horſe ſtartles at the ſight of a block; and the Elephant will not touch the ſtraw which the mouſe hath touched. Now for that Lion which killed the Cock and his Hens, I deny not but it may be true; yet hence we cannot conclude that the Lion is not afraid of the Cock: For a ſpeciall antipathy may by accident faile in ſome individuals. A particular exception muſt not overthrow an univerſall Rule or Maxime. Sheep are generally afraid of Dogs, yet I have ſeen a Sheep beat a Dog. Men generally hate Serpents, yet ſome will keep them in their boſomes; yea, eat them: And it may be that this Lion was mad, and ſo the phantaſie diſtempered: for they are ſubject to be mad becauſe of their heat; or elſe he was a hungred, and hunger we know makes even men tranſgreſſe the common lawes of Nature, and eat thoſe things which otherwiſe they hate.

II. That Spiders will kill Toads, is recorded in Story; yet the Doctor (3. *Book c.* 26.) in his Glaſſe *found that the Toad ſwallowed down the Spiders which he included.* This may be true, and the other untrue: For all Spiders are not venemous; and thoſe that are, have their degrees of venome, and ſo wee may ſay of Toads. That Spiders have a more active poyſon then the Toad, is confeſſed by thoſe who write of theſe inſects: For I read both in Ancient and Modern Writers, that Spiders have poyſoned Toads with their touch; but never that any Toad poyſoned a Spider: for the Doctors Toad did not poyſon but ſwallow the Spiders, being impatient of hunger, which it cannot endure ſo long as the Spider; ſome whereof I have kept nine moneths without food in a glaſſe, and then they were as nimble at the end of this time, as when I put them firſt in. Now that ſome of our Spiders are venemous, I have obſerved; for by chance one of my acquaintance bruiſed a Spider which had lighted on his face when he was in his bed, and preſently the place bliſtred and grew ſcabbed. I have likewiſe found, that the ſmall bodied Spiders with long legs (which as I think ſome call Spinners) are more venemous then the big ones: for I incloſed in a glaſſe ſome great black bodied Spiders with ſhort legs, with ſome of thoſe ſmall bodied long ſhanks, which fell upon the big bodied Spiders and killed them. Such is the

venome of ſome ſpiders that they will crack a *Venice* glaſs, as I have ſeen; and *Scaliger* doth witneſs the ſame, however the Doctor denies it.

III. *That the Baſilisk ſhould proceed from a cock's egg, is a conceit as monſtrous as the brood it ſelf*, ſaith the Doctor; and yet preſently after he grants, *there may enſue ſome imperfect or monſtrous production*. That cocks growing old and decrepid, lay eggs, or ſomething like eggs, on which they ſit, as hens do on theirs, is not to be denied: for many will witneſs this; among the reſt, *Lev. Lemnius* tels us (*de mirac. l.* 5. *c.* 12.) of two old cocks, which in the City of *Ciricæa*, could be ſcarce driven away from incubation on their eggs, till they were beaten off by ſtaves: And becauſe the Townesmen had conceived a perſwaſion that of this egg the Baſilisk might proceed, they cauſed the cocks to be ſtrangled, and the eggs to be bruiſed. It is granted then that cocks lay eggs, or ſome ſeminall matter which they exclude and ſit upon. 2. That of theſe eggs enſue ſtrange productions. 3. This may be without a commixture of the ſeed of both ſexes, (though the Doctor denieth it) for we ſee what ſtrange ſhapes of Inſects are produced of putrifaction even in mans body without any ſeed. 4. It is granted alſo that there have been and are Baſilisks, though the deſcriptions of them do in ſome circumſtances differ: For there may be divers ſorts of them; thoſe which *Lemnius* deſcribes, ſeen ſometimes in *Germany*, have acuminated heads, and ſomewhat yellow, three palmes long, having a belly with white ſpots, a blew back, a crooked tail, and a wide gaping mouth. This deſcription differs but little from that of *Albertus Magnus* (*de anim.* 25.) *Scaliger* ſpeaks of one that was ſeen in *Rome*; and *Lemnius* tels us that *Germany* is not free from them; but that they are not ſo venemous as thoſe of *Africa*. Now whether this Serpent is begot of the cocks egg, is the queſtion; we have tradition and witneſſes for it, beſides probability: for why may not this ſerpent be ingendred of a cocks putrified ſeminal materials, being animated by his heat and incubation, as well as other kinds of Serpents are bred of putrified matter.

IV. The Doctors reaſons againſt the two-headed *Amphisbæna*, are not ſatisfactory. 1. (ſaith he) *The principal parts, the Liver, Heart, and eſpecially the brain, regularly they are but one in any kinde whatſoever*. *Anſw.* This is not ſo: For God to ſhew his wiſdome and greatneſs, hath made variety of ſhapes among the creatures; ſome fiſhes and Inſects have no heads at all, ſome but one, the *Amphisbæna* two, as *Nicander*, *Galen*, *Ælian*, *Pliny*,

Pliny, and others witneſs. I have read of birds in *Paphlagonia* with two hearts, of the Serpent *Cherſydros* that hath two tongues; of a worm in *Taprobona* vvith four heads. I ſay nothing of the *Hydra*, becauſe doubtfull: vvhy then may not the *Amphisbæna* have tvvo heads? 2. He ſaith, *That it was ill contrived to place one head at both extreams; for it will follow that there is no poſterior or lower part in this animal. Anſw.* This vvill not follovv: for though the head be at both extreams, yet they do not both at the ſame time perform the office of the head; but vvhen the one moveth, the other ſuffers it ſelf to be moved, and is in ſtead of the tail; ſo that head vvhich moveth Eaſtvvard, dravveth the other after it; the former then is anterior, the other poſterior; and this when it moves Weſtward, draws the other: and ſo what before was poſterior, becomes now anterior. This was ſo ordained by nature for the more conveniency of this creature, which cannot turn it ſelf about ſo nimbly as other ſerpents do. And of this minde is *Ælian*(*de anim.*) 3. He ſaith, *That if this animal have two heads, it is not to be called one, but two, becauſe* Ariſtotle *ſaith, that animal is not one but two, which hath two hearts: and therefore geminous births are chriſtned with two names, as having diſtinct ſouls. Anſw.* There may be ſome reaſon why two hearts ſhould give demonſtration to two animals: becauſe the heart is the originall of life, and all vital actions, which need but one fountain and original: but the reaſon is not alike in the *Amphisbæna's* two heads: for though it harh but one life, and conſequently but one heart, yet it hath two ſeveral motions backward and forward: and therefore needed two principles or prime movers by reaſon it cannot turn ſo readily it ſelf about as other animals, which though they have but one head, yet have divers inſtruments of motion ſubſervient to that head, which are defective in the *Amphisbæna*: and yet the head is uot the originall of all motions in our own bodies: for the hearts motion of *Syſtole* and *Diaſtole* depends not upon it. Beſides, the Doctor denies not but *there are bicipitous ſerpents*, and yet are not called two from their two heads: Why then ſhould the *Amphisbæna* be denied this priviledge? But he ſaith, *theſe other are monſtrous productions, and beſides the intention of Nature.* He ſaith, but he proves it not: I acknowledge no monſters in Inſects, eſpecially in ſuch as are begot of the Suns heat and putrifaction: nor is there any ſhape in them beſides the intention of Nature. For if by nature he means the matter, it is not beſides its intention to receive any form: if he underſtand the Suns influence, or formative power, or

God himſelfe, it is not againſt their intention to produce all kind of ſhapes for the ornament of the world. But if theſe bicipitous productions were againſt their intentions, yet this will not ſerve his turn, becauſe ſuch a production is but one, although it hath two heads. Laſtly, geminous births receive two names in Baptiſme, not becauſe they have two heads, but becauſe they have two diſtinct ſouls, and individuall properties flowing thence; ſo that they are indeed two individuals, though their body be but one from the Navell downward, as that Monſter was of which *Buchanan* ſpeaks. Now the *Amphiſbæna* having but one ſenſitive ſoule, cannot be called two notwithſtandiug its two heads. 4. *Many animals* (ſaith he) *with one head perform contrary motions. Anſw.* It will not follow that therefore the *Amphisbæna* hath but one head, or that theſe one-headed animals can as eaſily perform contrary motions with one head, as that which hath two. Neither are theſe contrary motions performed immediatly by one head, but by inferior organs which are not in this animall. Beſides, I obſerve that in many worms there is as much life and activity in the taile as in the head; and therefore may be ſaid to have two heads effectively, if not formally. For in Damask-Roſe leaves which I kept by me, not being throughly dried, worms were procreated, whoſe heads when I cut off, their bodies were moved by their tails, as if thoſe had been other heads.

V. Concerning the Viper, which all Antiquity affirms, produceth her young ones to her own deſtruction; we finde ſome Neotericks doubt, nay deny this truth. Doctor *Brown* reaſoneth againſt this production, 1. *It's injurious to Natures providence to ordain a way of production which ſhould deſtroy the producer. Anſ.* Natures providence is no more injured in the corruption then in the generation of the Creatures: ſeeing the corruption of one is the generation of another; and not onely in Vipers, but in Silk-worms alſo, and divers other creatures, in production the producer is deſtroyed. And this alſo we may obſerve in men and women oftentimes: Nature is wiſer in her productions then we are in our conceits and imaginations. 2. *It overthrowes* (ſaith he) *Gods benediction, Be fruitfull and multiply. Anſw.* Gods benediction of multiplication was not pronounced to the beaſts and creeping things, but the birds and fiſhes. 2. It's a queſtion whether Vipers and ſome other poyſonous creatures were created before the fall. 3. The viper multiplieth faſt enough when at one birth ſhe bringeth forth twenty young ones, as *Ariſtotle* and others affirm; there is then no

cauſe

cauſe to complain, when twenty are produced by the loſſe of one; neither is it a greater curſe in the Viper to die, then in all other living creatures; for all are mortall in their individuals, though immortal in their ſpecies. 4. If the viper had been created before the Fall, yet this puniſhment was not inflicted on her till after: for all creatures doe fare the worſe by reaſon of *Adams* ſin, *who hath made them all ſubject to vanity*, *Rom.* 8. 3. *To bring forth in ſorrow* (ſaith he) *is proper to the woman, therefore not to be tranſlated on the Viper. Anſw.* I deny that painfull births are proper to the woman: for all animals have ſome pain more or leſſe in their productions. I have ſeen a Hen, which with the pain of excluding her Egge, fell down gaſping for breath, as if the pangs of death had bin on her, and ſo ſhe continued till the Egge was excluded. Many Bitches and other females have died with pain at the time of their littering. Painfull productions then is a puniſhment of the woman, and yet no tranſlation to the Viper; for her pain is not thereby eaſed, becauſe the Viper in ſuch a caſe is killed: nor are all women alike tortured, ſome are leſſe pained then many other creatures. 4. *This overthrowes* (ſaith he) *Natures parentall proviſion: for the Dam being deſtroyed, the younglings are left to their own protection. Anſw.* No, they are left to the protection of him who is by *David* called the *Saviour both of man and beaſt:* and by the ſame is ſaid to *feed the young Ravens when they call upon him.* And God in *Job*, long before *David*, ſheweth, That *he fills the appetite of the young Lions, and provideth food for the young Ravens when they cry unto God.* For the Naturaliſts tell us, the old Ravens quite forſake their young ones; but God feeds them with Flies and Wormes he ſends into their neſts. The like improvidence and cruelty we find in Oſtridges, who exclude their Eggs in the ſand, and ſo leave them without further care, to his providence, in whom all things live, and move, and have their being: Therefore God complains in *Job*, (*Chap.* 39. 14, 15, 16.) of the Oſtridges aſtorgie and cruelty, in leaving her Eggs in the earth, forgetting that the foot may cruſh them, or that the wild beaſt may break them: ſhee is hardned (ſaith he) againſt her young ones, as though they were none of hers. The Cuckow alſo wanteth parentall proviſion: for ſhe layeth her Egge in another birds neſt, and ſo leaves it to the mercy of a ſtranger. And no leſſe cruelty is there in this young nurſling, then in the viper: for he both deſtroyeth his Foſter-brothers, and the mother that brought forth and fed him. I read alſo in *Ælian* of Scorpions begot ſometimes in Crocodiles Egges, which ſting to death the

Dam that gave them life. The young Scorpions doe uſe to devour the old. I have alſo read of women who have brought forth monſters to the deſtruction both of the mother and of the child in her womb: therefore what the Ancients have written of the vipers cruelty, is not a matter ſo incredible as the Doctor makes it As for the experiments of ſome Neotericks who have obſerved the young vipers excluded without hurt to the parent; I anſwer, 1. There is great odds between the Vipers of *Africk* or other hot Countries, and thoſe in cold Climats; and ſo there is in poyſonable herbs and Serpents, which loſe their venome upon tranſplantation: in cold Countries the moſt fierce, cruell, and poyſonable animals loſe theſe hurtfull qualities. 2. The works of Nature in ſublunary things, are not univerſally the ſame; but, as the Philoſoper ſaith, ὡς ὅπι τὸ πολυ, for the moſt part there is no Ruleſo generall, but hath ſome exceptions; ordinarily the child comes out with the head forward, yet ſometimes otherwiſe; ordinarily the child is born at the end of the ninth moneth, yet ſometimes ſooner, ſometimes later: Therefore though ordinarily the young Vipers burſt the belly of the Dam, yet ſometimes they may be excluded without that rupture. 3. Education and food doe much alter the nature of creatures; theſe vipers mentioned by *Scaliger* and others, which excluded their young ones, or viperels by the paſſage of generation, were kept in bran within boxes, or glaſſes, and fed with milk, bran, and cheeſe, which is not the food of thoſe wild vipers in hot Countries. It is no wonder then if the younglings ſtaied out their time in the womb, being well fed, and tamed by the coldneſſe of the climat. 4. All the Ancients doe not write that the vipers burſt the belly, but only the membrans and matrix of the Dam, which oftentimes cauſes theiloſſe of her life; and they wanted not reaſon, beſides experience, for this aſſertion, to wit, the fierceneſſe of their nature, the heat of the countrey, and the numerouſneſſe of their young ones, being twenty at a time; beſides the goodneſſe of God, who by this means doth not ſuffer ſo dangerous a creature to multiply too faſt; for which cauſe alſo he pinches them ſo in the Winter, that they lie hid and benumbed within the earth; beſides, he will let us ſee his juſtice, in ſuffering the murther of the Sire to be revenged by his young ones upon the Dam. As for the Doctors exception againſt *Nicanders* word ἀποκόπτειν, it is not material; for it is a Poetical! expreſſion, and what is it to the purpoſe, whether the head be bit, or cut off, if ſo be the bite be mortall?

CHAP.

CHAP. X.

1. *Moles ſee not, and the contrary objections anſwered.* 2. *The opinions of the Ancients concerning divers animals maintained.* 3. *The right and left ſide defended.* 4. *The true cauſe of the erection of mans body, and the benefit we have thereby.* 5. *Mice and other vermin bred of putrefaction, even in mens bodies.* 6. *How men ſwim naturally; the Indian ſwimmers.*

COncerning Moles, the Doctor proves they are not blind, (*Book* 3. *cap.* 8.) becauſe they have eyes: for we muſt not aſſigne the Organ and deny the Office. *Anſw. Scaliger* tells us they have not eyes, but the form of eyes. *Pliny* (*lib.* 11. *cap.* 37.) ſaith, They have the effigies of eyes under the membrane, but no ſight, being condemned to perpetuall darkneſſe. *Ariſtotle* (*lib.* 3. *de Animal.*) ſaith, φαίνεται, it ſeems they have eyes under a thin skin, and a place for eyes. The Prince of Poets calls them, *Oculis captos*, (*Geor.* 1.) *Scaliger* (*Exer.*243.) ſaith, They are deprived of the nobleſt ſenſe, and gives the reaſon, becauſe living ſtill under ground, they had no uſe of ſight. If then by eyes are meant the perfect organs of ſight, with all things requiſite thereto, I deny they have eyes, and conſequently ſight: they have neither the organ nor the office, except we ſay, that like is the ſame. Now theſe forms of eyes Nature gave to the Moles rather for ornament then uſe; ſo wings are given to the Oſtrich, which never flies; and ſo a long tail to the Rat, which ſerves for no other uſe but to be catched ſometimes by it. And to what end hath Nature given teats to men, and other males? Again, Nature in all her works aims at perfection; but is oftentimes hindred by ſome obſtacle, which is the reaſon why the Mole wants eyes, and the *Manucodiata* feet: but what is defective in the Moles eye, is recompenſed by the quickneſs of his hearing. 2. He ſaith, That *they are not exactly blind; for they can diſcern the light, which is one object of viſion. Anſ.* I do not believe they can diſcern the light at all. 2. If they could diſcern the light, yet they are blind: for I have known men ſtark blind, who yet have diſcerned light from darkneſſe when a candle came into the room. 3. Light is not the object of viſion; for we ſee not light, but lucid and coloured; we ſee not light, but by it: Light is *Objectum quo, non quod.* 3. He ſaith, *A Mole cannot be properly blind, if it want the organs or capacity of ſeeing: for privations preſuppoſe habits.*

Anſw. A Moal is as properly blind as he in the ninth of *John*, who was born ſo; for he had no capacity of ſeeing naturally, no more then the Moal; yet he is ſaid to be blind from his nativity, and that properly, becauſe he was a ſubject capable of ſight, *quatenus* an animall or ſenſitive creature, which is capable of ſight, becauſe of ſenſes, whereof the ſight is one. Moals therefore are capable of ſight, in the genius of *animals*, though not in the *ſpecies* as a Moal, and ſo an Oyſter is capable of ſight.

2. The Doctor prying too narrowly into the ſayings of the Ancients, reckoneth them amongſt his *Vulgar Errors*, which being rightly underſtood, are no errors at all; as when they ſay the Elephant hath no joynts, they meant their joynts were ſtiffe, and not ſo eaſily flexible as thoſe of other animals. When they write that the Swan ſings, they meant that with their wings they made a kind of harmonious noyſe, as the learned Poet expreſſeth in that Verſe:

Cantantes ſublime ferunt ad ſidera Cygni;

Which he explains in another place,

Ut reduces ludunt illi ſtridentibus alis.

When they ſay the Lampery hath nine eyes, they mean ſo many ſpots reſembling eyes. When they write, that a Horſe and Dove have no gall, they mean, that theſe have not baggs of gall annexed to the Liver, as other animals. When they ſpeak of Griffins, that they were animals like Eagles in their foreparts, and behind like Lions; they ſpake myſtically, ſhewing by this hieroglyphick, the valour, magnanimity, courage, and audacity that ought to be in Princes and Governours. And when they write, that Toads doe piſſe, they did not ſpeak properly, but onely meant, that they ſquirted out ſome liquid matter behind. When they ſpoke of the Toads ſtone, they do not mean a true and proper ſtone, but a concretion or induration of their crany. When they write that Hares are double Sexes, they write no more then what hath been obſerved in other animals which are Hermophroditicall, and in whom ſometimes females have been changed into males. Hares alſo make a ſhew of a double Sex, becauſe of the two Tumors repreſenting Teſticles, and their holes or cavities near the ſiege in the males, by which they ſeem alſo to be females. And what they write of their ſuperfœtation, is true: for the like is incident to ſome other animals, even to women. When they ſay that Snails have eyes at the

the ends of their horns, their meaning is, that theſe are like eyes. So when they hold, that all animals of the land, are in their kind in the ſea, they mean that there was a great reſemblance between the ſea and land-animals. So when they write, that the Peacock is aſhamed when he looks on his black feet, they write ſymbolically, intimating that pride ends in ſhame, when men look upon their deformities and infirmities. When they ſay, whelps are blind nine dayes, they mean that they are ſo for the moſt part, though ſome be blind three or foure dayes longer. When they write that Worms have no blood, they write properly; for how can thoſe have blood which have no liver, or other ſanguifying organs? that red humour in them is not blood properly, but analogically.

11. That there is in man a right and a left ſide, is manifeſt by Scripture, generall conſent, Experince and Reaſon, which alſo prove the dignity, agility, and ſtrength of the right ſide above the left; becauſe on the right ſide is the Liver, the ciſtern of blood, in which conſiſteth our life, vigor & ſtrength, therefore this ſide is not ſo often as the left ſubject to palſies, becauſe it is ſtronger to reſiſt and repell the matter of that diſeaſe into the weaker ſide. Yet Doctor *Brown* (*Book* 4.c.5.) denies any *prepotency in the right ſide, and ſuch as ariſeth from the conſtant root of Nature, becauſe he finds not Horſes, Bulls, and Mules, are generally ſtronger on this ſide. Anſ.* There is great diverſity between the conformity, ſituation, and parts of mans body and beaſts, and therefore to reaſon from the one to the other, is abſurd: We find not that variety of colours in the eyes of Horſes, Bulls, and Mules, that are in Mans eyes; nor doe we find the Horſes gall annexed to his liver; ſhall we hence inferre a deficiency of things in man? The weight of the Bodies of Four-footed Beaſts, lieth equally upon all foure, and all foure equally are uſed in motion; and therefore there was no reaſon why any ſide or legge ſhould be more prepotent then another; but it is otherwiſe in man, to whom Nature hath given one ſide ſtronger and nimbler then another for uniformity of action. Hence the right hand and foot are ſtronger then the left. Neither is it Cuſtome but Nature that hath given this dexterity to the right ſide: For I have known ſome who have endeavoured by cuſtome to bring their left hand to perform the offices of the right, but could never doe it with that eaſe and dexterity. *Scaliger* and *Cardan* ſpeak of one who had never a hand, yet with his right foot could perform all the offices of the right hand, write, ſew, eat, drink, & fling darts. 2. He ſaith,

that

that children indifferenly uſe either hand. *Anſw.* That is becauſe as yet in the tender infant the heat and ſtrength of the body is equally diffuſed, and not ſetled in one part more then in another; but as he begins to gather ſtrength, and the body to be more ſolid, ſo doth the right hand begin to be more agill; though I deny not but in ſome the left hand is more agill, but theſe are few, and aberrations from the common courſe of Nature: for we ſee that in all her works there are ſome accidentall deviations. His other objections are coincident with theſe two, and his diſcourſe of the right and left ſide of heaven, is impertinent to thi s purpoſe: therefore I will ſpend no time in refelling it: for ſome make the Eaſt, ſome the South the right part of heaven; but I will conclude with *Ariſtotle*, (*hiſt. animal.* 1. *c.* 15) the right ſide and left in man conſiſt of the ſame parts; but the left ſide is every where weaker.

IV. The end why mans body was made erected, was to look up toward heaven, whence the ſoul hath its originall, where our hopes ſhould be, and our happineſs ſhall be; by the contemplation of which, we are brought to the knowledge of Gods goodneſs and wiſdom: For the heavens declare the glory of God, and the firmament his handy work, *Pſal.* 19. Yet the Doctor (*book* 4. *c.* 1.) *will not have this the end of mans erection, but out of* Galen *the exerciſe of Arts, which could not be performed in any other figure. Again* (ſaith he) *the eyes of divers fiſhes regard the heavens; birds who have no upper eye-lid, have in this the advantage of man: So the poſition of the frog with his eyes above the water, ſerves to behold a great part of the heavens.* *Anſw.* All theſe are weak Aſſertions; for the God of Nature created man to enjoy happineſs, and to glorifie him; this is the chief end of his creation. Now this happineſs is heaven, by beholding which, our knowledge of God is confirmed, our hopes eſtabliſhed, and our joy and affections to heavenly things are enlarged: The invention of Arts then was but a ſecondary end, which it ſeems *Galen*, that meer naturall man, thought to be the chief end. And whereas the Doctor ſaith, (that by *ſurſum aſpicere*, was not meant to look upward with the eye, but to have his thoughts ſublime;) I would know what means ſo forcible to ſublimate the thoughts as the eye? All knowledge and affection of and to the object, comes by the ſenſes. How ſhould *Abraham* have known the glory and multitude of his poſterity, had he not looked up (as God commanded him) to the ſtars? The wiſe men found Chriſt in *Bethlehem* by looking upward to heaven, where they ſaw his ſtar. Chriſt in bleſſing the bread, and in praying

Praying, looked up towards heaven: ſhould not our eyes be fixed there where our treaſure is? Our Saviour went up to heaven, and we exſpect him again to return with the clouds of heaven. Our eyes then ſhould be directed thither as well as our thoughts. The Philoſophers by the knowledge of the firſt *Mobile*, came to the knowledge of the firſt mover. And though birds, ſome fiſhes and frogs, may have an advantage in looking upward, yet this advantage was not given them to look on heaven, of which they have neither knowledge, hope, affection or intereſt: they look upward then not to contemplate heaven, but to watch either flies to feed on, or kites, hawkes, and other ravenous fowle to avoid them.

V. He doubts *whether mice can be procreated of putrifaction.* So he may doubt whether in cheeſe and timber worms are generated; Or if Betels and waſps in cowes dung; Or if butterflies, locuſts, graſhoppers, ſhel-fiſh, ſnails, eeles, and ſuch like, be procreated of putrified matter, which is apt to receive the form of that creature to which it is by the formative power diſpoſed. To queſtion this, is to queſtion Reaſon, Senſe, and Experience: If he doubts of this, let him go to *Ægypt*, and there he will finde the fields ſwarming with mice begot of the mud of *Nylus*, to the great calamity of the Inhabitants. What will he ſay to thoſe rats and mice, or little beaſts reſembling mice, found generated in the belly of a woman diſſected after her death, of which *Lemnius* is a witneſs, who thinks this generation might proceed of ſome ſordid excrement or ſeminal pollution of thoſe animals with which the womans meat or drink had been infected. I have ſeen one whoſe belly by drinking of puddle water, was ſwelled to a vaſt capacity, being full of ſmall toads, frogs, evets, and ſuch vermin uſually bred in putrified water. A toad hath been found in a ſound piece of Timber.

VI. *That men ſwim naturally he cannot aſſent to, becauſe other animals ſwim as they go; but man alters his natural poſture as he ſwims,* (4. *Book* c. 6.) *Anſw.* This is no reaſon; for man alters his natural poſture when he crawls; will it follow therefore, that this motion is not natural to man. But to ſpeak properly, ſwimming is no natural motion, neither in man nor beaſt: For if we take natural as it is oppoſite to animal, ſwimming is an animal motion; and if we take natural as it is oppoſite to artificial, then ſwimming is an artifical motion; for there is ſome Art in it. But if we take nature for a propenſity, facility, inclination, or diſpoſition; then, I ſay, theſe are as well in men

men as in beasts. Therefore *Pliny* tells us of the *Troglodites*, that they swim like Fishes. *Lerius*, *Acosta*, and other *Indian* Historians write, that the *American* children begin to swim as soon as they begin to walk; and that for eight dayes together they can live in the Sea, and longer if it were not for feare of the great Fishes: so swift and skillfull they are in swimming, that they out-swim the Fishes and catch them; and so farre they exceed other animals in this motion, that they can swim with the left hand onely, holding hooks and darts in the right, which no other creature can doe. If it be objected, That swimming is not naturall to man, because he learns it; I answer, That walking and talking are naturall actions to man, and yet he learns both when he is a child. So I have seen old birds teach their young ones to flye. Lastly, if it be naturall for beasts to swim because of their posture, then it must needs be as naturall to those wilde men, who from their infancy were brought up among wild beasts, to walk upon all foure, having no other posture.

CHAP. XI.

1. *The Pictures of the Pelican, Dolphin, Serpent, Adam and Eve, Christ, Moses, Abraham, and of the Sybils defended.* 2. *The Pictures of Cleopatra, of Alexander, of Hector, of Cæsar, with Saddle and Stirrops maintained.*

THe Doctor [*Book* 5. *c.* 1.] quarrels with some pictures, as 1. with that of the Pelican *opening her breast with her Bill, and feeding her young ones with her blood.* But for this he hath no great reason: for *Franzius* (*de animalib.*) to whom he is beholding for much of his matter, tels him that this and divers other pictures are rather Hieroglyphical and Emblematical, then truly Historicall: for the Pelican was used as an Emblem of paternall affection among the Gentiles; and of Christs love to his Church among the Christians. 2. With that of the Dolphin, *because he is painted crooked, whereas his naturall figure is straight.* This is true, yet he is crooked sometimes, as when he leaps and jumps, and in this posture the painters expresse him. 3. With the Serpent tempting *Eve*, *because it is painted with a virgins head, which might afford suspition to Eve in beholding a third humanity beside herselfe and Adam.* But this could not so much trouble *Eve*, to speak with one like her selfe, as to hear a reasonable

reaſonable diſcourſe proceed from a Serpents mouth; for ſhe could not be ſo groſly ignorant in that happy ſtate, where there could be no deception of mind, as to think a ſerpent could ſpeak and diſcourſe rationally; therefore Sathan cunningly aſſumes a womans face, whereby there might be the leſſe ſuſpition. neither could *Eve* be amazed to ſee a Serpent with a womans face: for divers other creatures have the form of humane faces, ſuch as Baboons, Apes, Monkies, Satyrs, and that *American* beaſt mentioned by *Andrew Thevet*, called *Haijt* by the Inhabitants, and *Guedon* by the *French*; the picture whereof may be ſeen in *Geſner*. 4. He quarrels with the pictures of *Adam* and *Eve* with Navels, *accounting thoſe parts in them uſeleſſe ſuperfluities; becauſe the uſe of the Navell is to continue the infant unto the mother, and by the veſſels thereof to convey its aliment.* The Navell, which is the center of the body, was not uſeleſſe or ſuperfluous in *Adam* or *Eve*; becauſe they were ornaments, without which the belly had been deformed: Therefore *Solomon* amongſt other beautifull ornaments of the Church, puts in the Navel for one, *Thy Navel*, ſaith he, *is like a round Goblet*, *Cant.* 7. 2. He might as well quarrell with the picture for giving haire to *Adam* and *Eve*; for the ſole uſe of haire both for head and chin, is for ornament and diſtinction. 5. He queſtions Chriſts picture with long hair, ſeeing *he was no Nazarite by vow.* I anſwer, 'Tis true, he was no Nazarite by vow; for he drank Wine, and approached the dead, yet he was a true Nazarite, becauſe he was as the Apoſtle ſaith, *ſeparated from ſinners*: Therefore it was fit he ſhould in this reſpect weare long haire, as *Sampſon* the Nazarite and Type of Chriſt had done before. Beſides, haire being an ornament, and ſigne of ingenuity (for ſlaves durſt not weare long haire;) and being alſo the cuſtome of thoſe times and Countries, it is moſt probable he wore long haire; and therefore his picture is cauſleſly quarreld with; eſpecially ſeeing he was ſo painted in that picture ſent by *Lentulus*, Preſident of *Judea*, to *Tiberius*. And in the ſame length of hair he was found in ſome old braſſe coins at *Rome*, which *Theleus Ambroſius* did ſee; in his Introduction to the *Chaldee* Tongue, he ſpeakes of this. 6. He rejects *Abrahams* picture ſacrificing *Iſaac*, *becauſe he is deſcribed as a little boy.* Anſw. *Joſephus* makes *Iſaac* at that time 25 years of age; ſome Rabbins make him above thirty. But *Aben Ezra* the Rabbin makes him onely twelve years old: And ſure at this age he might be able, by his Fathers help, to carry a bundle of wood up the hill, being men were ſtronger at that time then now; howbeit he was but a Boy in compariſon

of

of his fathers age, who was now 125 years old, if *Isaac* was 25. for he was born in the hundredth yeare of his Fathers life. 7. He reproves the picture of *Moses*, *becauſe painted with horns.* It was not the Painter but the Scripture which gave him horns. For the *Hebrew* word *Keren* is ſo tranſlated by *Aquila* κεραπώ. δης ἦν, and by *Jerom*, *Cornuta*: So it is in the vulgar Editions of *Sixtus* and *Clemens*. So it is tranſlated by divers Proteſtants, by *Munſter*, by *Rivet*, and ſome others, and therefore *Munſter* doubts whether that relation of *Steuchus* be true, that the Jewes are offended when they ſee *Moſes* painted with horns, ſeeing *R. Solomon* and *Kimchi* doe uſe the word *Horn*, ſaying, That the beams of *Moſes* face did reſemble horns; and therefore *R. Solomon* calls thoſe Rayes the horns of Magnificence. It is true, there is a difference between *Keren* and *Karon*, that ſignifying a horn, this to ſhine; but who could put this diſtinction truly, before the invention of the Hebrew pricks; neither is it materiall which way it be tranſlated, ſeeing clear horns do caſt rayes of light, and luminous bodies caſt abroad their rayes like horns, as we ſee in the Sun and Moon. Neither is there any danger of conformity with *Jupiter Ammon*, (as the Doctor thinks) if *Moſes* be painted with horns: for *Jupiter* was painted and worſhipped not with Rams horns alone, but with the Rams head and ſkin, with which his Image was yearly adorned; becauſe in the ſhape of a Ram he ſhewed a Well of water to *Bacchus*, when he was dry in the Deſarts of *Libya*; and becauſe he turned himſelfe into a Ram when he fled from the Giant into Ægypt. And laſtly, he ſhewed himſelfe to *Hercules* in the ſhape of a Ram. As for cornuted *Pan* and *Bacchus*, they were the ſame with *Jupiter*, one Sun under divers names and ſhapes, as *Macrobius* ſhewes. 8. He reproves the pictures of the Sybils, *becauſe there be ten or twelve of them, and all with youthfull faces.* For the number of ten, he muſt reprove *Varro* (*de Divinat.*) not the Painter, for ſo many he delivers to us; others have added two more. And that there were ſo many, *Boiſardus* makes it appeare by what he hath collected out of ancient Authors, concerning the difference, originals, times, and numbers of the Sibyls, where he ſhewes, that *Sibylla Cumæa* whom *Æneas* conſulted, and *Cumana*, who ſold the Bookes to *Tarquin*, were different, between whom were ſix hundred years diſtance. As for their youthfull faces, he hath more reaſon to quarrell with the Poets then with the Painters; but indeed neither are to be blamed; For the Sibyls may be aged, and yet look young, as many aged people doe; ſome I have already

mentioned,

mentioned who looked young after they have been an hundred and fifty yeares old. 'Tis true, that *Sibyl* is called *Longæva* by the Poet, (*Æn.* 6.) but by that was ſignified her long life, not a withered or wrinkled face. The ſame word is by the ſame Poet aſcribed to *Æneas*, whom not withſtanding he makes immortall; and *Romulus* in *Ennius* is ſaid, *Degere ævum* in heaven; ſo in *Æſchylus* the gods are called δαρεῖοι, that is, *Longævi*, who I think have not old faces. As in *Charon*, ſo in the *Sybils*, there was *Cruda viridiſque, ſenectus.* It is true alſo that *Sybil* is termed *Anus* in *Livii.* But I deny the Doctors Etymology out of *Feſtus*; for *anus* is *ab annis*, and not from ἄ and νῦς, as if ſhe had doted; for ſhe could not be ἄνους, that was δι' ὃ βελὴ: *Sibylla* is ſo called, as being the mind and counſel of God, therefore could not be a dotard.

II. There are ſome other pictures which offend the Doctors eyes; as, 1. That of *Cleopatra with two Aſps.* *Suetonius* ſpeakes of one, *Florus* of two, ſo doth *Virgil*,

Nec dum etiam geminos à tergo reſpicit angues.

So doth *Propertius*,

Brachia ſpectavi ſacris admorſa colubris.

He ſhould therefore have reproved theſe rather then the Painter; he ſhould alſo have quarrelled with *Auguſtus*, who from the prickes he found in her arms, concluded ſhe was bit by Aſps, and therefore imployed the *Phylli* to ſuck out the poyſon. But whether ſhe was bit by one, or two, or none, the picture is harmleſſe, and conſonant both to *Roman* Hiſtorians and Poets. 2. The pictures of the nine Worthies diſpleaſe him; *becauſe Alexander is deſcribed ſitting upon an Elephant, Hector on Horſeback, and Cæſar with Saddle and Styrrups.* But he ſhould remember that Painters and Poets have a priviledge above others,

Pictoribus atq; Poetis quid libet audendi
ſemper fuit æqua poteſtas. Horat.

And yet theſe pictures are partly hiſtoricall, partly hieroglyphical. *Alexander* ſits on an Elephant, to ſhew his conqueſt over the Indians which moſt abound in Elephants. Beſides, this picture hath reference to that ſtory of the Elephant in *Philoſtrates*, (*Lib.* 2. *Cap.* 61.) which from *Alexander* to *Tiberius* lived three hundred and fifty yeares:

This

This huge Elephhant *Alexander* after he had overcome *Porus*, dedicated to the Sun in theſe words, Ἀλέξανδρος ὁ Διὸς τὸν Αἴαντα τῷ ἡλίῳ; for he gave to this Elephant the name of *Ajax*, and the inhabitants ſo honored this beaſt, that they beſet him round with Garlands and Ribbons; they uſed alſo to anoynt him, and adorned him with a golden chain, It was not then without cauſe he is painted ſitting on an Elephant, rather then *Judas Macchabæus*, or any others who have overcom battels wherein were Elephants; or *Cæſar*, whoſe triumph was honored with captive Elephants; for he was not the firſt, long before him *Curius Dentatus* was thus honored, and ſo was *Metellus*, who had an hundred and twenty captive Elephants in his triumph. Again, the Doctor asks, *Why Hector is painted upon an horſe?* I anſwer, becauſe he was a brave Cavalier, and kept excellent Horſes; ſuch, as if we will believe *Homer*, had underſtanding: for *Hector* makes an eloquent ſpeech to them, and his wife *Andromache* fed them with good bread and wine, (*Iliad. lib.* 8.) Their names were *Zanthus*, *Podargus*, *Aithon* and *Lampus*: Is it likely that he would keep ſuch horſes and never ride them? whereas Horſmanſhip was in uſe long before. And we read in *Pindarus*, (in *Olympiad.*) that the Grecian Princes took delight in keeping and riding of good Horſes. And although the Ancients uſed to fight in Chariots, yet ſometimes they fought on Horſeback too, being as *Pliny* ſaith, taught ſo to fight by the Theban Centaurs. As for *Cæſars* Saddle and Stirrops, they are neither diſhonour to his picture, nor repugnant to ſtory; for though we find ſome of the ancient equeſtral Statues without Saddle or Stirrops, it will not thence follow theſe were not in uſe; for we find the ancient *Roman* Statues bare-headed; will it therefore follow there were no uſe of Helmets, or that they fought or rid bare-headed? But we doe not find (ſaith the Doctor out of *Salmuth* upon *Pancerol*) the word *Stapida* in ancient Authors. I anſwer, We find words equivalent; for what is *Suppedaneum*, *Pedamentum*, *Subex*, *Pedaneus*, and *Staticulum*, but the ſame that *Stapida* which we call Stirrup? So we find *Ephippium* in *Horace* [*Optat Ephippia bos piger*] and *Equorum ſtrata* found out by *Pelethronius* in *Pliny*, and what were theſe but Saddles? For to take *ſtratum* there for an Horſe-cloth, is ridiculous, as if that had been ſuch a piece of invention to be recorded, to cover the Horſe back with a piece of Cloth. *Appian* writes of the Numidians, that they uſed to ride without Saddles; but nothing of the *Romans*. The two verſes which the Doctor citeth out of *Salmuth* to prove his Aſſertion,

Aſſertion, are needleſſe; for in the one is left out the principall word, *Saltus ſuperbus emittat in currum*: So that *Turnus* did not leap on Horſeback; but into his Chariot, [*Æn.* 12.] The other, *Corpora ſaltu ſubjiciunt in equos*, ſhews, that they jumped on Horſeback; but whether by ſtirrups or not, is not there ſet down.

CHAP. XII.

1. *The Picture of Jephtha ſacrificing his daughter maintained.* 2. *The Baptiſt wore a Camels skin.* 3. *Other pictures, as of S. Chriſtopher, S. George, &c. defended.* 4. *The antiquity, diſtinction and continuance of the Hebrew tongue, of the Samaritans, and their Letters.*

THe picture of *Jephtha* ſacrificing his daughter, is queſtioned by the Doctor (5 *Book c.* 14, 15, 16, *&c.*) *becauſe* (ſaith he) *ſhe died not a natural but a civil kind of death. Anſw.* Indeed her death was neither natural nor civil, but violent, being ſacrificed by her father. This he denieth; *becauſe ſhe bewailed her virginity, not her death. Anſw.* She had no reaſon to bewaile her death, to which ſhe freely offered herſelf; but to die childleſſe deſerved lamentation, becauſe that was a curſe among the Iſraelites. 2. *Becauſe the women went yearly to talk with Jephtha's daughter, which had ſhe been ſacrificed they could not have done. Anſw.* The word *Letanneth* from *Tanan*, ſignifieth to lament, and ſo it is rendred θρήνειν, by the Seventy; and *Leallaah* by the Chaldee Paraphraſt; ſo it is interpreted by *Munſter*, by the old Latin Edition, by the *French* and *Engliſh* tranſlation. But ſuppoſe the word were derived from *Tanah*, to declare or ſpeak, yet this will not prove *Jephtha's* daughter was alive: For in mournfull complaints and lamentations over the dead, words and Elegies were oftentimes expreſſed, and Proſopopeia's are uſed to them as if they were alive; as we ſee *Davids* Lamentation for *Jonathan*, and in other places both of ſacred and profane writ. So did that ſorrowful mother ſpeak to her dead ſon *Eurialus*, and *Æneas* to dead *Pallas* in the Poet. 3. Becauſe it is ſaid in the Text, *And ſhe knew no man*, he inferres, that virginity was her onely death. *Anſwer.* Theſe words, *ſhe knew no man*, are added to ſhew the cauſe why the women ſo much lamented her death, in that ſhe died childleſſe. 4. *The offering* (ſaith he) *of mankind, was againſt the Law of God. Anſw.* True: But will it therefore follow, that *Jephtha* did not ſacrifice

his daughter. He may as well infer, that *David* committed not adultery and murther, becauſe theſe were againſt the Law of God. How often are Gods Laws violated by the beſt of his ſervants? 5. He thinks *the Prieſts and people would have hindred this ſacrifice; and that* Jephtha *was no Prieſt; and that he had evaſion for his vow by redeeming his daughter; and that his vow of Sacrifice was to be underſtood only of that which was ſacrificeable and lawfull. Anſw.* Theſe are but the conjectures of thoſe who would defend *Jephtha*: for it is more likely neither Prieſt nor people durſt oppoſe his reſolution, being now ſtrong and crowned with victory; and though he was no prieſt, yet it was no unuſual thing for Princes and great Commanders ſometimes to perform the Prieſts office; and though he might have evaded his vow, yet it ſeems he knew not ſo much, for ſuperſtition had blinded him: therefore he ſaith, *I have opened my mouth to the Lord, and I cannot go back.* And doubtleſs he thought that the ſacrificing of his daughter was lawfull; grounding this his conceit upon Gods command to *Abraham*, and commendation of him for his readineſs to ſacrifice his ſon. Laſtly, he ſaith, the 31 verſe may be thus rendred, *It ſhall be the Lords; or I will offer. Anſw.* Moſt Tranſlations have it, *and I will offer*; although the Hebrew *Ve*, ſometimes ſignifies *Or*; but this is ſeldom. Hence then we ſee, the Painter is not to be blamed, who in repreſenting *Jephtha's* ſacrifice, is waranted by the Scripture, by *Auſtin*, *Ambroſe*, and *Hierom*, by the ancient Rabbins, and *Joſephus*, beſides reaſons. For what needed *Jephtha* ſo to vex himſelf, and tear his cloathes, if he meant only to ſequeſter his daughter from marriage and humane ſociety? Again, there was neither Law nor Preſident for him to vow his daughters virginity; nor could ſuch a vow be effectuall without her conſent. It was a curſe alſo in *Iſrael* to be childleſs, and it had been ridiculous in him or her, to vow virginity and then to lament it.

II. He excepts againſt the picture of *John Baptiſt, becauſe he is painted in a Camels skin, whereas the text ſaith his garment was of Camels hair. Anſw.* It was fit the Baptiſt, who came to preach repentance for ſin, ſhould wear a garment of skins, which was the firſt clothes that *Adam* wore after he had ſinned; for his fig-leaves were not proper, and this garment alſo ſhewed both his poverty and humility. For as great men wear rich skins, and coſtly furs, he was contented with a Camels skin. By this garment alſo he ſhewes himſelf to be another *Elijah*, (2. *Kings* 1.) who did wear ſuch a garment, and to be one of thoſe of whom

whom the Apoſtle ſpeaks, who went about in skins, of whom the world was not worthy. Neither was it unuſefull in *Johns* time, and before, to wear skins; for the prophets among the *Jews*, the Philoſophers among the Indians, and generally the Scythians did wear skins; hence by *Claudian* they are called *Pellita juventus*. Great Commanders alſo uſed to wear them; as *Hercules* the Lyons skin, *Aceſtes* the Bears, *Camilla* the Tigers. *Johns* garment then of Camels hair, was not as ſome fondly conceit, a Sack-cloth, or Chamblet; but a skin with the hair on it. So in *Exodus* (*chap.* 25.) the people are commanded among other skins, to bring to the Tabernacle Goats hair: not as if they were to pluck off the hair for *Aaron*, and keep the skins to themſelves, but to offer both: therefore in the originall *Hairs* is not expreſſed, but the word *Goats*.

III. In ſome ſubſequent Chapters the Doctor queſtions the pictures of S. *Chriſtopher* carrying Chriſt over the river, of Saint *George* on Horſe-back killing the Dragon, of S. *Jerom* with a clock hanging by, of Mermaids, Unicorns, and ſome others, with ſome Hieroglyphick pictures of the Ægyptians. In this he doth *luctari cum larvis*, and with *Æneas* in the Poet,

Irruit & fruſtra ferro diverberat umbras.

He wraſtles with ſhadows: for he may as well queſtion all the Poetical fictions, all the ſacred Parables, all tropicall ſpeeches; alſo Scutchions, or Coats of Armes, ſignes hanging out at dores, where he will finde blew Boars, white Lions, black Swans, double-headed Eagles, and ſuch like, deviſed onely for diſtinction. The like devices are in military Enſignes. *Felix* Prince of *Salernum* had for his device, a Tortoyſe with wings flying, with this Motto, *Amor addidit*; intimating, that love gives wings to the ſloweſt ſpirits. *Lewis* of *Anjou*, King of *Naples*, gave for his device, a hand out of the clouds, holding a pair of ſcales, with this Motto, *Æqua durant ſemper*. *Henry* the firſt of *Portugal*, had a flying Horſe for his Device. A thouſand ſuch conceits I could alledge, which are ſymbolical, and therefore it were ridiculous to queſtion them, as if they were hiſtoricall. As for the Cherubims, I find four different opinions: 1. Some write they were Angels in the form of birds. 2. *Aben Ezra* thinks the word *Cherub* ſignifieth any ſhape or form. 3. *Joſephus* will have them to be winged animals; but never ſeen by any. 4. The moſt received opinion is, that they had the ſhape of children: for *Rub* in Hebrew, and *Rabe* in Chaldee, ſignifieth a *child*; and *Che*, *as*: So then, *Cherub* ſignifieth, *as a child*, and it's moſt likely they were painted in this form.

IV. For the Doctors queſtioning divers ſuperſtitious obſervations,(5. *book*, *c.* 22.) as the croſſing of a Hare, the falling of ſalt, the breaking of Eggſhels, and ſuch like: I have nothing to ſay, but to conclude with him, that they are ſuperſtitious, yet ancient. But when he asks, *whether the preſent Hebrew be the unconfounded language of Babel.* I anſwer, That if by the preſent *Hebrew* he mean the language which they now ſpeak, it is not: for as the greateſt part of the world loſt that tongue (except *Hebers* family) at the confuſion of Babel, ſo *Hebers* family) the Jewes) loſt it themſelves in the captivity of Babel; for being mingled with the Chaldeans, they made a mixt language of *Hebrew* and *Chaldee*, which for diſtinction ſake was called *Syriac*; and ſometimes *Hebrew*, becauſe the Jewes, *Hebers* poſterity, ſpake it. Hence *S. Hierom* is to be underſtood when he writes, that *Matthew* penned the Goſpel in *Hebrew*, and *Euſebius* when he calls it his native language, they mean the *Siriac*, which was now the native language of the *Hebrewes*; and S. *Paul* in the *Acts* is ſaid to have made a ſpeech to the people in *Hebrew*, the meaning is, he ſpake in *Syriac*; for they underſtood not the ancient *Hebrew*, onely the Prieſts and Lawyers kept the knowledge of it. Therefore it had been vain for *Matthew* to write his Goſpel, or for *Paul* to ſpeak in pure *Hebrew* to thoſe that underſtood it not; yet there is an *Hebrew* Goſpel of S. *Matthew* extant, which ſome think was written by S. *Bartholomew* and by *Pantænus*, coetaneal with *Origen* brought from the *Indies*, this imperfect and torn Copie, *Munſter* ſaith he extorted from the Jewes. But if his queſtion be whether that *Hebrew* text now extant, be the ancient *Hebrew* tongue before the confuſion; I anſwer It is: For though the Jewes loſt their ancient language in reſpect of ſpeaking and uſe, yet the Bible was carefully retained in the true *Hebrew* without any alteration, ſave onely in the Characters or Letters, which about the captivity were changed by *Eſdras*, as *Hierom*(*de emendat. temp. p.* 621.) *Joſeph Scaliger*, *Joh. Druſius Caſper Waſerus*, *lib.* 2. of his old *Hebrew* coin, and *Sethus Calvitius* in his Chronological Iſagoge witneſſeth, that this was done by *Eſdras* to debar all commerce with the Samaritans, not the Iſraelites, which were long before carried away by *Salmanaſſer*; who alſo were called ſamaritans from their chiefe Citie Samaria, but I underſtand that rable of Nations which *Salmanaſſer* brought in to poſſeſſe the Iſraelites lands. Theſe with ſo many of the ancient Samaritans or Iſraelites as remained in the land, retained the ancient Hebrew characters in which the Law was given by *Moſes*; and theſe letters

for

for diſtinctions ſake were named Samaritan; and thoſe of *Eſdras* called *Hebrew*, and ſquare from their form. Some ancient coins, as Sicles, have been found with Samaritan characters on them, which ſhew this difference. The form of theſe letters may be ſeen in the Samaritan Alphabets. As theſe Samaritan retained the ancient characters, ſo they did the ancient Pentateuch of *Moſes*, and no more. Now that *Hebers* poſterity retained their language without mixture after the Flood, is proved by *Auſtin* and *Jerome* out of the Hebrew Names given to the creatures before the Flood. It ſtood alſo with reaſon that *Hebers* family ſhould not be partakers of the worlds puniſhment in this confuſion of tongues, ſeeing they were not guilty of their ſins.

CHAP. XIII.

1. *There is not heat in the body of the Sun.* 2. *Iſlands before the Flood proved.* 3. *The ſeven Oſtiaries of* Nilus, *and its greatneſs. The greatneſs of old* Rome *divers ways proved.* Nilus *over-flowing, how proper to it: the Crocodiles of* Nilus; *its inundation regular.*

THe Doctor in his ſubſequent diſcourſes (*6 Book c.* 1, 2, 3, 4, 5, 6) hath many learned Coſmographicall paſſages collected dextrouſly out of many approved Authours, againſt which I have nothing to ſay; onely he muſt give me leave to diſſent from him in his opinion concerning the Suns heat, when he ſayes, that *if the Sunne had been placed in the loweſt ſpheare where the Moon is, by this vicinity to the earth its heat had been intollerable.* What will he ſay then to that world lately diſcovered in the Moon by glaſſes as fallacious as the opinion is erroneous. Surely theſe people muſt live uncomfortably where the heat is ſo intollerable; or elſe they muſt have the bodies of Salamanders, or elſe of thoſe *Pyruſtæ* in the Furnaces of *Sicily*: but indeed though the Sunne work by the Moon upon ſublunary bodies, yet the Moon is not hot, nor capable of it, no more then the line is capable of that ſtupidity which from the Torpedo is conveyed by the line to the Fiſhers hands. No celeſtiall body is capable of heat, becauſe not paſſive; except we will deny that quinteſſence, and put no difference between Celeſtial and Elementary bodies. The Sun then is not the ſubject but the efficient cauſe of heat; the prime ſubject of heat is the element of fire, the prime efficient cauſe is the Sun, which can produce heat, though he be not hot himſelf. And this is no more ſtrange then for him to produce, life, ſenſe, vegetation, co-

lours, odors, and other qualities in ſublunary bodies, which notwithſtanding are not in him, though from him. Again, if the Sun be the ſubject of heat, becauſe he is the original and effector of it; then *Saturn* is the ſubject of cold, the Moon of moiſture, and *Mars* of drineſſe, and ſo we ſhall place action and paſſion, and all elementary qualities in the heavens, making a Chaos and confuſion of celeſtial and ſublunary bodies. Moreover, if the Suns vicinity cauſeth the greateſt heat, why are the tops of the higheſt mountains perpetually cold and ſnowy? Why doe there blow ſuch cold windes under the Line, as *Acoſta* ſheweth? We conclude then, that the Sun is the cauſe of heat, though he be not hot; as he is the cauſe of generation and corruption, though he be neither generable nor corruptible *Ovid* then played the Poet not the Philoſopher, when he cauſeth the Suns vicinity to melt *Icarus* his waxen wings.

II. He ſayes, That *Iſlands before the Flood are with probability denied by very learned authors*. *Anſw*. He doth not alledge any one probable reaſon out of theſe Authors in maintenance of this opinion. I can give more then probable reaſons that there were Iſlands before the Flood, Firſt, the whole earth it ſelfe was made an Iſland; therefore the Sea is rightly called *Amphitrite*, from encompaſſing the earth; For this cauſe *David* ſaith, That *God hath founded the Earth upon the Waters*. And though Earth and Sea make but one Globe, yet the Earth onely is the Center of the world, as *Clavius* demonſtrates. 2. The world was in its perfect beauty before the Flood; but Iſlands in the Sea tend no leſſe to the beauty and perfection of the world, then Lakes upon the Land. 3. All the cauſes of Iſlands were as well before the Flood as ſince; for there were great Rivers running into the Sea, carrying with them mud, gravell, and weeds, which in time become Iſlands. There were alſo Earthquakes, by which divers Iſlands have been made, the vapour or ſpirit under the bottome of the Sea thruſting up the ground above the ſuperficies of the water; and who will ſay, that in the ſpace of 16. hundred years before the Flood there ſhould be no Earth-quakes? Again, in that time the Sea had the ſame power over the neighbouring lands which it hath ſince the Flood. But we find that Iſlands were made by the Sea waſhing away the ſoft and lower ground in peninſules at this day; there doubtleſs the Sea wanted not the ſame force and quality before the Flood: for there were as forcible winds, and as impetuous waves. Laſtly, Iſlands are made when the Sea forſakes ſome Land which it uſeth to over-flow; and this proper-

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ty also we cannot deny to have been in the Sea before the Flood; for there were windes to beat off the Sea, & to drive together heaps of sand into some altitude, whereby the water is forced to forsake the land, whence hath proceeded divers Isles.

III. He saith (*Book* 6. *c.* 4.) *there were more then seven Ostiaries of Nilus.* *Answ.* There were but seven of note, the other four were of no account, but passed by as inconsiderable: Hence they were called ψευδοστόματα; therfore the stream of all waters run upon seven; so *Virgil*, *septem discurrit in ora.* And *Æn.* 6. *septem gemini turbant trepida ostia Nili.* *Ovid* calls the River *Septemfluus*; by others it is named *Septemplex*; by *Valerius*, *septem amnes*; *Claudius* gives it, *septem cornu*; *Manilius*, *septem fauces*; *Ovid*, *septem portus*; *Statius* *septem hiemes*; *Dionysius* Afer, ἑπτὰ στόματα. These seven mouthes have their particular names given them by *Mela* and other Geographers, and so the Scripture gives it seven streams, *Isajah* 11. 15. at this day there are but foure left, two of which are of little use; therefore the Doctor needed not to have troubled himselfe so much as he doth, because so frequenely this is called the seven-mouthed river; for it is usuall to give denominations not from the exact number, but from the most eminent and major part of the number, He may as wel except against *Moses*, who ind ivers places reckons but seventy souls which went down into Ægypt; and yet Saint *Steven* in the Acts mentions 75 souls. Again, he dislikes the Title given by *Ortelius* to *Nilus* when he calls it *the greatest river of the world.* But *Ortelius* was not mistaken in calling it so; for it is the greatest, though not perhaps in length, because it may be some are longer, the which are not certainly known; yet in breadth when it overflowes the whole Countrey, in which respect it may be called rather a Sea then a River; and so it was called by the Ancients, as *Pior Valerius* sheweth. *Nile*, saith *Basil*, is liker a Sea then a River, and some esteem the length of it a thousand German miles, or 35. degrees, having Summer at the springs thereof, and Winter at the other end the same time. It is also the greatest in regard of use and benefit; for no River doth so much enrich a Countrey as *Nilus* doth *Egipt.* It is the greatest also in fame; for no River is so renowned in Writers. By the world also is meant so much as is known to us; for the Rivers of *America* are known rather by hearsay then otherwise. The greatness of this River was of old Hieroglyphically expressed by the vast body of a Giant. There is a Statue of *Nilus* in the *Vatican*, the picture whereof is in *Sands* his Travels, the

greateſt of Poets, by way of excellency calls this the *Great River*, *In magno mœrentem corpore Nilum.* Again the Doctor will have *Rome* (magnified by the Latines for the greateſt of the earth) to be leſſer then *Cairo*; and *Quinſay* to exceed both. But he is much miſtaken; for *Cairo*, as *Sands* tells us who was there, is not above 5. *Italian* miles in length with the ſuburbs, and in bredth ſcarce one and a halfe; whereas *Rome* was almoſt fifty miles in compaſſe within the walls, and the circuit of the ſuburbs much more, as *Lipſius* (*de mag. Rom. l.* 3. *c.* 2.) hath collected out of divers Authors: He ſhewes the greatneſſe of it alſo by the number of the people therein; for there were three and twenty thouſand poor which was maintained upon the publick charge; then if we reckon the multitude of rich men, and their train, which was not ſmall: (for divers of the great perſons; maintained families of foure hundred perſons;) if we look upon the multitude of Artificers, of Souldiers, of Courtiers, of ſtrangers from all parts flocking thither, as to the great Metropolis and ſhop of the World, we ſhall find there were no leſſe then four millions, or fourty hundred thouſand people, which is more then can be found in many large provinces. *Heliogabolus* collected the greatneſs of this City by the Cobwebs found in it, which being gathered together, did weigh ten thouſand pound. Another argument of its greatneſs may be collected out of *Euſebius* his Chronicle, who reckons that for many dayes together there were buried of the plague ten thouſand daily. Not without cauſe then was *Rome* called the Epitome of the world; by *Ariſtides* ἐργαστήριον τῆς γῆς the Earths workhouſe, and ἀκρόπολις, the worlds Citadel, or Caſtle; by Saint *John*, the great Citie, and the great Babylon; by *Virgil*, *Maximum rerum*. And it ſtood with reaſon that *Rome* ſhould be the greateſt of Cities, being the Queen and Miſtreſs of the greateſt Empire, of ſuch large Territories, and full of people, Cities and Nations. *Rome* then was every way the greateſt Citie, both in extent, in power, in people, in glory, in magnificence. What Citie ever had that multitude of ſtately Palaces, Temples, Theaters, Oliſks, triumphant Arches, Baths, and other publick buildings, as *Laurus* ſheweth? As for *Quinſay* in *China*, we have a fabulous narration in M. *Paulus Venetus*, that is was an hundred miles in compaſſe; but his narrations have been found erroneous, and if the Kingdome of *China* comes far ſhort of the greatneſſe of the *Roman* Empire, ſurely *Quinſay* muſt fall ſhort of *Rome*, which as the Poet ſaith,

Inter alias tantum caput extulit urbes,
Quantum lenta ſolent inter viburna cupreſſi.

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As for *Quinſay* now it is not thirty miles in compaſſe, as *Nicolas de Contu* ſheweth who was there. Again he ſaith, That *this anuall overflowing is not proper unto Nile, being common to many currents in Africa.* I anſwer, It is ſo proper to *Nile*, that no other River doth ſo orderly, ſo frequently, ſo fully, overflow their banks as this doth. *Crocodiles* (ſaith he) *are not proper to Nile. Anſw.* They are ſo proper, that no river either in Africk, Aſia, or America, hath ſuch Crocodiles as *Nilus*, if either we conſider the magnitude, multitude, or fierceneſſe of them; Other Crocodiles, chiefly the American, are gentle, the Ægyptian fierce and cruel, which is the cauſe that Dogges are ſo afraid to drink out of *Nilus*, whence aroſe that proverb, *Canis ad Nilum*, The greateſt Indian Crocodiles exceed not twenty foot in length, as *Scaliger* ſhewes; but thoſe of *Nile* are three hundred foot long, whoſe jawes are ſo wide, that one of them can contain a whole heifer at a time: ſome have been found there of 25, and above 26. cubits in bigneſs, as *Ælian* reports. The Romans to ſhew how proper this beaſt was to *Nile*, repreſented Ægypt by a Crocodile in that Coin on which *Auguſtus* ſtampt a Crocodile tied to a palm-tree, with this Inſcription, *Primus relegavit*; for he ſubdued Ægypt, and reſtored peace to them. Again he ſaith, That the *Cauſes of Niles inundation are variable, unſtable, and irregular, becauſe ſome yeares there hath been no increaſe at all. Anſw.* He may as well ſay, that the cauſes of all natural effects are variable, becauſe ſometimes they faile: But all naturall cauſes operate for an end; therefore are conſtant, regular, and ſtable, ſo are not Chance and Fortune, which *Ariſtotle* excludes from naturall cauſes: Are the cauſes of rain, and ſtorms irregular, variable, and unſtable; becauſe ſometimes it rains more in Summer then in Winter? Or is generation irregular, becauſe ſometimes women miſcarry? Naturall cauſes alwayes produce their effects, or for the moſt part ſo, that they faile but ſeldome, and that upon the interpoſition of ſome impediment, whereas fortuitall cauſes produce their effects ſeldome: The cauſes then of *Niles* overflowing, are not contingent, but certain, conſtant, regular, and ſtable; becauſe they never faile, or but ſeldom upon ſome impediment in the producing of that effect. As for the Ægyptian raines I have ſpoken elſewhere, (*animad. on Sir Walt. Raleigh*,) Now becauſe of this regular, conſtant, and beneficial inundation of *Nilus*, it was called *Jupiter Ægiptius*, and divine honours were given to it, its annual feſtival was kept about the Summer Solſtitial, when it overflows the land. This was called by the Greeks, τὰ Νειλῶια the

the Prieſts uſed to carry the water of *Nile* on their ſhoulders with great ſolemnity to their temples, falling down on their knees, and lifting up their hands, gave ſolemne thanks to *Jupiter Nilus*, to whoſe honour they dedicated a certain piece of coin with this Inſcription, *Deo Sancto Nilo.*

CHAP. XIV.

1. *The cauſe of* Niles *inundation.* 2. Lots *wife truly transformed into a ſalt Pillar.* 3. *Hels fire truly black: brimſtone cauſeth blackneſs.* 4. Philoxenus *a glutton, and his wiſh not abſurd: How long necks conduce to modulation.*

THe *Inundation of Nilus* (ſaith the Doctor) *proceeds from the rains in Æthiopia.* This I deny not, becauſe averred by *Diodorus*, *Seneca*, *Strabo*, *Herodotus*, *Pliny*, *Solinus*, and others both ancient and modern Writers: and it ſtands with reaſon; for the Springs of *Nilus* are neere the Tropick of *Capricorn*, where it is winter when the Sun is with us in *Cancer*: then doth it rain abundantly in that Southern climat; for though within the Tropicks the Suns vicinity cauſeth rains, yet without his diſtance is the occaſion thereof: His melting of ſnow upon the Hils of Æthopia is a cauſe of this inundation. But *Scaliger* denies that there is any ſnow at all; yet I doe not think the high mountains there ſhould be leſſe ſubject to ſnow then in *Peru* under the line, although the people in the low Countries thereof be black, and the windes in the vallies warm. The third cauſe of *Nilus* overflowing, are the *Eteſiæ*, or northerly windes, which blow there every yeare when the Sunne is in *Cancer*. This winde blowing into the mouth of *Nile*, keeps it from running into the Mediterranean ſea. *Scaliger* refutes this reaſon, becauſe at the ſame time the river *Nigir* which runs into the Weſtern Ocean, overflows his banks; but to this I can eaſily anſwer, That at the ſame time there be different *Eteſiæ*, or conſtant windes in different regions of the world; ſo that whilſt the North wind blows againſt *Nilus*, the Weſt or South-weſt, which alſo as *Acoſta* ſaith, is predominant upon the coaſt of *Peru*, blowes againſt *Nigir*. As for the original of *Nilus*, it hath been ſtill held uncertain; *Pliny* writes that King *Jubia* found out the ſprings thereof in the *Mauritanian* Mountains; but ſince, this river hath been found as far as the lake *Zaire*, which is in ten degrees of Southerly latitude. The Ægyptian Sultan did ſpare neither for men nor coſt to ſearch out theſe ſprings, but

but could not find them; therefore *Virgil* calls theſe ſtreams of *Nilus*, *Latebroſa flumina*. *Herodotus* witneſſeth, that neither Ægyptian, Grecian, nor *African* could reſolve him any thing of *Nilus* ſprings. Hence in *Homer Nilus* is called διοτρεφὴς, that is, falling or deſcending from *Jupiter*, becauſe God onely knew the original of this river.

The Doctor (*book 7. c. 11.*) *will not queſtion the metamorphoſis of Lots wife, whether ſhe were transformed into a reall ſtatue of ſalt, though ſome conceive that expreſſion metaphoricall.* That the expreſſion is not metaphorical, but the transformation real, is manifeſt by the teſtimonies of the Rabbins, by the *Thargum* of Jeruſalem, by the beſt expoſiters, by *Joſephus* and *Borchardus*, in whoſe times that ſtatue of Salt was yet extant; beſides divers reaſons doe evince the ſame: For it was as eaſie for God to turn her body into a ſalt Pillar, as to turn *Moſes* rod into a Serpent, *Nilus* into blood, *Nebuchadnezzar* into a beaſt. 2. We ſee daily transformations in generation, and in our own nutrition. 3. Nature can transform mens fleſh into Worms, Calves fleſh into Bees, Horſes and Aſſes fleſh into Waſps and Hornets. We read alſo of Birds procreation out of old Timber, of *Japonian* dogges transformed into fiſhes, of water turned into ſtones, and of an Oyſter metamorphoſed into a Bird, which was preſented to *Francis* the firſt of *France*. 4. The Magicians of Egypt transformed divers ſubſtances, and the Devil by Gods permiſſion hath often done the like; examples of which may be ſeen in *Spuedanus*, *Camerarius*, *Peucerus*, and others. 5. The Gentiles who laugh at this transformation are convinced by their own ſtories or Fables, of *Ulyſſes* and his fellowes transformed into beaſts; and of *Diomedes* his companions metamorphoſed into birds; if they can believe theſe changes, why ſhould they doubt of *Lots* wifes tranſmutation?

III. To conceive a general blackneſſe in hell, and yet therein the material flames of ſulphur, is no Philoſophical conception, nor will it conſiſt with the real effects of its nature. Anſw. What though this were no Philoſophical conception, nor conſiſting with the effects of Nature, is it therefore untrue? God is not ſubject to Philoſophical conceptions, nor to the lawes of nature who could make fire to burn, but not conſume the buſh, and make the fiery furnace burn the Chaldeans, and yet not ſindge a haire of the three childrens cloathes; the ſame power can make blackneſſe and the flames of ſulphur dwel together in hell; and which is more, he can make fire, which naturally is accompanied with light, to be the ſubject of darkneſs in Hell. But the

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Doctor is deceived by his experiments, who thinks that ſulphur affords no blacking ſmoak; for I know the contrary by blacking paper with the ſmoak thereof. Beſides, both Philoſophers and experience tell us, that the ſulphurous vapours which in thundring and lightning break through the clouds, do make black the things touched with them; ſo ſaith *Ariſtotle*, *Pliny*, and others: And though Brimſtone make red Roſes and Tiffany white, it wil not therfore follow that it will make any thing white; the Sun beams which whiteneth the Linnen, tawns the skin; and if the whiming of things by ſulphur, proceeds as he ſaith from its drying and penetrating quality, much more would all things be whitened by the Sun and fire, whoſe heat is more penetrating and drying; but we ſee how many things by them are blackned; and the very heat of the fire will induce blackneſſe upon paper, though there come no ſmoke at all to it. He therefore who long ſince deſtroyed *Sodom* with fire and brimſtone, will with the ſame materials puniſh the wicked in hell, where ſhall be in ſtead of light, blackneſs and darkneſs.

IV. Philoxenus the Muſician deſired a Crains neck, not for any pleaſure at meat, but fancying thereby an advantage in ſinging, (*Book* 7. *c.* 14.) *Anſw.* That this *Philoxenus* was a glutton, ancient Hiſtorians do affirme, and that he wiſhed a Cranes neck to enjoy the longer pleaſure of meat and drink, is aſſerted by *Ariſtotle*, *Athenæus*, *Machon* the Comick, *Ælian* and others: *Machon* ſayes, that he wiſhed a neck of three cubits long. He was a great Fiſh eater, therefore was nick-named *Phylichthys*, and *Soleniſta* from *Solenes*, a kind of Oyſters which he delighted in. Being one day at Table with *Dionyſius* the tyrant, he had a ſmall mullet ſet before him, which he takes up in his hand, and holds to his eare; *Dionyſius* asks what he meant by that? He anſwers, that he had asked advice of *Galatæa*, but ſhe ſayd that ſhe was too young to adviſe him; and that he were beſt to conſult with the old *Galatæa* in *Dionyſius* his diſh: At which the Tyrant laughing, gave him the great Mullet that he had before him, which was very pleaſing to the glutton. This ſtory is recorded by *Cælius Rhodiginus*, and doubtleſs that proverb, *Collaria cadavera*, that is long necked carcaſſes, which *Eraſmus* borrowes from *Ariſtophanes*, hath relation to this wiſh of *Philoxenus*; for by it are meant Gluttons and Drunkards, who being buried in ſleep and wine, are little better then dead carcaſſes with long necks, as this *Philoxenus* was, whoſe belly was his God; of whom it is recorded, that when he ſaw a diſh of good meat, he would ſpit upon it, that he might enjoy it all alone: Yet

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the Doctor denies this wiſh upon no other ground, but *becauſe it was abſurd.* Sure this is no ground at all; for it is no unuſuall thing with Gluttons and Drunkards, both to wiſh and doe abſurdly. His wiſh was not ſo auſurd as that of *Midas*, vvho vviſhed all he touched might become gold; or that of *Heliogabalus*, vvho vviſhed and longed that he might eat the *Phœnix*, being the onely ſingle bird in the World. Again, this vviſh of *Philoxenus* was not ſo abſurd as the Doctor thinks: for though the Tongue be the organ of taſt, yet the Oeſophagus cannot be altogether taſtleſſe, ſeeing there is one common membrane which is nervous to it and the Tongue. Now the membrane of the Tongue is the medium of taſt: vvill any man ſay then, There is no taſt or pleaſure in deglutition? We find by experience, how unpleaſant to the throat is the diſcent of bitter pills, or potions; ſo that I could never yet ſwallow a bitter pill, be it never ſo ſmall. That there is much pleaſure in deglutition of ſweet meats and drinks, is plain by the practice of thoſe vvho to ſupply the vvant of long necks, uſe to ſuck their drink out of long ſmall Canes, or Quils, or glaſſes with long narrow ſnouts: And others for vvant of theſe vvill tipple leaſurely, and let their liquor glide down the throat gently and by degrees: therefore doubtleſſe *Philoxenus* knew that a long neck conduced much to the pleaſure of eating and drinking, which made him vviſh for a Cranes neck, that he might enjoy for ſome longer time the reliſh of his delicate viands, which gave the name afterwards to dainties and ſweet meats; for they vvere termed *Placentæ Philoxenia*. Again, when he ſaith, That *it had been more reaſonable if Philoxenus had wiſhed himſelfe a Horſe; becauſe in this animall the appetite is more vehement*; he is deceived, for the vehemency of the appetite is no pleaſure, but pain; there is no pleaſure in hunger and thirſt, but in eating and drinking. And indeed there is no reaſon that he who loved fiſh and ſweet meats ſo well, ſhould wiſh himſelfe a Horſe, vvho muſt content himſelfe vvith Oats and Hay, and ſomtimes vvith dry ſtraw, without any ſawce; he ſhould rather have vviſhed himſelf to have been *Apuleius* his Aſſe, who ſometimes filled his belly with good pies, and other dainties. Laſtly, when he ſaith, That *canorous birds have ſhort necks, and that long necked birds are not muſicall.* I anſwer, It is not the length of the neck that hinders medulation, but the wideneſſe thereof: For which cauſe youth before puberty, women, & Eunuchs, have more melodious voyces then men, whoſe *aperæ arteriæ*, vvith other veſſels, are dilated by the heat of the Teſticles: For

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therwiſe we find that the length of the neck is a help to ſinging: Hence birds thruſt out their necks when they chant, which the Poet intimates when he ſaith,

Longa canoros dant per colla modos.

Therefore the proportionable length of wind-inſtruments doth conduce to modulation.

CHAP. XV.

1. *Heavy bodies ſwim in the dead ſea: and the Ancients in this point defended.* 2. Craſſus *had reaſon to laugh at the Aſs eating Thiſtles: Laughter defined: in laughter there is ſorrow; in weeping, joy.* 3. *That Chriſt never laughed, proved.* 4. *Fluctus Decumans, what?*

THat heavie bodies will not ſink in the Lake *Aſphaltites*, or dead ſea of *Sodome*, is affirmed by *Ariſtotle*, *Solinus*, *Diodorus*, *Juſtin*, *Strabo*, *Plutarch*, *Joſephus*, and others, and confirmed by the practice of *Veſpaſian*, caſting into that lake captives bound, vvho floated and ſunk not: Beſides that, it ſtands with reaſon; for ſalt vvater will ſupport heavie burthens, much more will that vvater which is thickned with a forcible ebullition of Sulphur and Bitumen; yet the Doctor (*Book* 7. *c.* 15.) *will not believe but that heavy bodies doe ſink there, though not ſo eaſily as in other waters.* Therefore rejects *Pliny's* ſwimming of Bricks, *Mandevils* Iron, and *Munſters* burning Candle, which finks not there, as fabulous; yet all this may be true: for the ebullition may be ſo forcible, the water ſo thickned with the Bitumen, the ſulphurous vapours and ſpirits ſo violently tending upward, that they may waft up Bricks and Iron, and not ſuffer them to ſink. A greater wonder then this may be ſeen in thoſe that write of *Ætna*, *Veſuvius*, the burning hills of *Iſland* and *America*, whence are belched out and elevated into the air, great ſtones by thoſe fiery vapours which iſſue out of thoſe *Vulcans*. Within theſe twenty years *Veſuvius* caſt out great ſtones above twenty miles diſtance. And therefore it is no ſuch wonder for a burning Candle to ſwim, which being extinguiſhed, ſinketh; for the flame adds levity to it. But let us ſee the Doctors reaſons, 1. *Joſephus* (ſaith he) *affirms that onely living bodies float, not peremptorily averring they cannot ſink, but that they doe not eaſily deſcend.*

ſcend. *Anſw.* The words of *Joſephus* are theſe (*de bel. Jud. l.* 5. *c.* 5.) *The moſt heavy bodies that are being caſt into this Lake, float upon it, neither can any man be eaſily drowned there, though he would.* Here *Joſephus* ſpeaks both of living bodies, that though they would, they cannot ſink eaſily; they may force themſelves perhaps to dive under the water, but not without difficulty, and he ſpeaks alſo of the heavieſt things in generall. *Ariſtotle* (ſaith he) ſpeaks lightly thereof, ὥσπερ μυθολογοῦσι, *and eſteemeth thereof as a Fable.* *Anſw.* *Ariſtotle* ſpeaks not lightly but ſeriouſly of this Lake; for from the quality of ſupporting heavy bodies, he deduceth one of his prime Arguments to prove the ſalſedinous quality of the Sea. But the Doctor deceiveth himſelfe in the word μυθολογοῦσι, as if this did ſtill ſignifie a fabulous relation; whereas in that place, and elſewhere, it ſignifieth a ſerious narration. So *confabulari* in Latin doth ſignifie conference of ſerious matters for the moſt part: μυθέω is to ſpeak, not to tell Fables, from μύθος, a word or ſpeech. In *Homer*, νεᾶ ἐξὸν δ' ὅπι μυθον ἔτελλε, ſignifieth a grave and ſerious ſpeech made by *Agamemnon*. So in the ſame Poet, μυθολογέω is to ſpeak and diſcourſe. The like in *Phocylides*, μέτρον μὲν ἐσθίειν καὶ πίειν καὶ μυθολογεύειν; is to be moderat in eating, drinking, & ſpeaking. *Andrew Thevet* (ſaith he) *ſaw an Aſſe caſt therein and drowned.* *Anſw.* So ſaith *Camerarius* indeed, and I will not queſtion the truth of *Thevets* narration; there may be diuers reaſons of this, the violent hurling of the Aſſe with his burden under the vvater. 2. His ſudden ſuffocation by the ſulphurous exhalations. 3. The Lake in all places thereof, and at all times, hath not the ſame violent ebullitions, but ſometimes there is remiſſion. The Aſſe then might ſink in ſuch a place, and at ſuch a time when and where the boiling was remiſs, the vapours weak, and the water thinner then in other parts of the ſame Lake. But hence it will not follow, that in other parts, and at other times, the heavieſt bodies may not ſwim there.

II. That *Craſſus* never laughed but once, and that was at an Aſſe eating Thiſtles, ſeems ſtrange to the Doctor, yet he gives no reaſon for this, but only *that the object was unridiculous, & that laughter is not meerly voluntary.* But theſe are no reaſons: For a more ridiculous object there cannot be, then to ſee ſuch a medley of pleaſure and pain in the Aſſes eating of Thiſtles; for whilſt he bites them, they prick him, ſo that his tongue muſt needs be pricked, though perhaps his lips may be hard, and not ſo eaſily penetrable; whence aroſe the Proverb, *Like lips, like* [illegible]. But there was ſomthing elſe in this that moved *Craſſus* to laugh:

laugh: For he ſaw here the vanity both of moſt men taking pleaſure in thoſe things which are accompanied vvith much pain and ſorrow: *Beſides*, he ſaw here the folly of the *Roman* rich men, who held Thiſtles ſuch a dainty diſh, that they would not ſuffer poor men to eat thereof, engroſſing them vvith great ſummes of money to themſelves, vvhich notwithſtanding the Aſſes did eat on free coſt. Was it not then a ridiculous thing to ſee rich men pay ſo dear for Aſſes food, and to debarre poore men from that meat which they permitted to Aſſes? *Pliny* could not but laugh at the conſideration of this folly. 2. When he ſaith, that *Laughter is not meerly voluntary*, he can inferre nothing from hence, except this, That it was as naturall for *Craſſus* to laugh, as for others; which I deny: For ſome are more naturally inclined to it then others; all have not the like temper and conſtitution of body, ſome have hard and ſolid hearts, heavie and penſive ſpirits, which no ridiculous object can move to laugh; theſe are called ἀγελαστοί. There be others again who can never be moved to weep. But he gives us here a lame definition of laughter, when he ſayes, *It is a ſweet contraction of the Muſcles of the face, and a pleaſant agitation of the vocall organs.* Theſe are but the effects of laughter, the cauſe is the ſoftneſſe and agility of the heart, the cheerfulneſſe and levity of the ſpirits, moving firſt the Diaphragma, and by them the Muſcles. Again, there is a laughter called *Sardonius*, which is accompanied vvith a contraction of the Muſcles, but this is not ſweet, yet it is laughter; and in ſinging, vvhich is not laughter, there is an agitation of the vocall organs, accompanied vvith pleaſure. Laſtly, whereas he condemneth *Heraclitus*, *who by his weeping made a hell on earth*; he is deceived: For oftentimes there is hell in laughing, and a heaven in weeping; in tears there is often delight, and in laughing pain, and as *Solomon* ſaith, *Madneſſe*. *Ariſtotle* ſaith (1. *Rhet.*) That there is in ſorrow and tears a certain ſenſe of pleaſure; and as *Prudentius* ſaith,

Gaudia concipiunt lachrymæ, dant gaudia fletum.

[This is δακρυγενῆ. Teares (ſaith St. *Ambroſe*) feed the mind, and eaſe the heart, vvhich *David* found vvhen he ſaid, *My tears have been my meat day and night.* Good men therefore found not the uncomfortable attendments of hell in weeping, but rather the comfortable enjoyments of heaven.

III. The Scripture witneſſeth, that Chriſt wept thrice, but never that he laughed. The Doctor thinks *there is no danger*

to

to affirm the act and performance of that, whereof we acknowledge the power and eſſentiall property, and whereby he convinced the doubt of his humanity. *Anſw.* We deny not but there was in Chriſt, by reaſon of his humanity, the faculty of riſibility; yet it will not follow that therefore he did actually laugh: For this act is rather a property of levity and folly, then of reaſon and humanity; therefore we ſee women more inclined to laughing then men, childhood then old age, and fools then wiſe men. Neither needed Chriſt to prove his humanity by laughing, he proved it ſufficiently by weeping, which is the firſt demonſtrative act of our humanity as ſoon as we are born; onely *Zoroaſtres* the author of Magick, came like a fool laughing into the World. Again, he ſaith, *We need not fear to adſcribe that to the incarnat Sun, which is ſometimes attributed to the uncarnat Father.* *Anſw.* From a metaphoricall laughing which is adſcribed to the Father, to a naturall and reall laughing in the Son, can be no conſequence. God laughs figuratively, therefore Chriſt laughs really, is as good a conſequence, as if I ſhould infer, that man flieth naturally, becauſe God is ſaid to flie tropically. Laſtly, he ſaith, *It is not reaſonable to conclude from Scripture negatively, in points which are not matters of Faith.* *Anſw.* It is true, where the Scripture ſpeaks ſuperficially, and by the way of any thing, divers circumſtances are omitted, in which regard we may not conclude negatively; but where the Scripture ſpeaks exactly, as it doth of our Saviour, we may reaſon from the negative. For no leſſe then four Evangeliſts write the ſtory of Chriſt ſo fully, that they mention all his paſſions and affections, as his anger, joy, ſorrow, pity, hunger, thirſt, feare, weariſomneſſe, &c. They ſpeak that he mourned three ſeverall times. So when the Prophets deſcribe him, they ſet him out as a man of ſorrowes, acquainted with griefes, ſmitten of God, and afflicted, wounded for our tranſgreſſions, bruiſed for our iniquities, and ſtricken for our ſins. It is ſtrange then, that neither Prophet, Hiſtorian, Apoſtle, nor Evangeliſt, ſhould ſpeak a word of his laughing, and yet ſo punctually mention to us his griefs, ſorrows, and weeping: therefore not without cauſe did *Chryſoſtome*, *Auſtin*, *Baſil*, *Bernard*, and others, conclude negatively, That Chriſt never laughed, and yet he did not for this ceaſe to be a Man. For the like is recorded of *Craſſus*, Grand-father to that *Craſſus* who was killed in the *Parthian* war; who (as is ſaid) never laughed but once. It is alſo recorded of *Anaxagoras*, *Ariſtoxenes*, *Socrates*, *Cato*, *Nerva* the Emperour, and others, that they were never ſeen to laugh. Beſides, ſeldome or never

is laughing in Scripture taken in a good ſenſe; it is called madneſſe, and like the cracking of thorns: laughing is threatned to end in ſorrow, and woe is denounced to thoſe that laugh; but a bleſſing to the mourners. As for the priority of the heart above the brain, whereof the *Doctor* ſpeaks here, I have already proved out of *Ariſtotle*, and it is plain that in the Scripture it is of greater account then the brain, becauſe this is never mentioned, but ſtill the heart, let Phyſitians ſay what they wil for the brains principality.

IV. That *Fluctus decumanus, or the tenth wave, is greater or more dangerous then any other, &c. is evidently falſe.* Here the Doctor troubles himſelf to no purpoſe, in refuting the greatneſſe of the tenth wave, and tenth egge: For the tenth of any thing was not counted the greateſt, but the greateſt of any things was called by the name of *Tenth*; becauſe that is the firſt perfect number, as conſiſting of 1, 2, 3 and 4. It was alſo held a ſacred number; therefore the tenth of ſpoils was dedicated to *Hercules*, and from him called *Herculan*, the tenth of fruits was paid by the Corinthians to *Cyphelus* their King, by *Cyrus* to *Jupiter*, by the Arabians to *Sabis*, and long before by *Abraham* and *Jacob* to the true God. When there was yet no poſitive law, but the law of Nature. In the number then of Ten, the Ancients conceived there was perfection and excellencie: For Nature perfects man, and brings him into the world the tenth moneth; ſhe hath parted his hands into ten fingers, his feet into ten toes: ſhe hath given him ten paſſages for evacuation, in three ten dayes the male child is formed in the womb, in foure ten dayes the female: there be ten Heavens; they made up their muſick of ten ſtrings, their year of ten moneths, *Apollo* with the nine Muſes made up the full conſort, they uſed to drink but ten times in their Feaſts, the womans Dowry anciently was ten *Seſtertia* at leaſt; and the greateſt ordinarily *decies Seſtertium*, that is ten hundred thouſand pounds, of our money 7812. l. 10. s. Many other obſervations may be made of this number; therefore any thing that was greater then another, was called *Decumanum*. *Porta decumana* was the great gate of the Camp. *Limes decumanus* in grounds, was from Eaſt to Weſt; *decumana pyra* in *Pliny*, are great Pears; *Decumatio* was the calling forth of every tenth delinquent in an Army for puniſhment: And *Lipſius* thinks that from them the great gate of the Camp out of which they went, was called *Decumana*. This number alſo of *Ten* is muſical in Scripture, as may be ſeen in divers paſſages thereof. Now whereas he ſaith, That *the Greeks*

expreſſe

expresse the greatest wave by the number of three, as their word τριχυμία *shewes.* This he hath from *Erasmus* in his Adagies: but I think the word is not from τρία, *three*, but from τρίω, *I fear*; so this τριχυμία is not the third wave, but the most terrible & greatest wave. Hence the Latin *Decumanus* should be rendred δεκακυμία, not τεικυμία.

CHAP. XVI.

1. Epicurus, *a wicked and wanton man, impious in his opinions.* Seneca's *judgement of him.* 2. *Twelve of his impious and absurd opinions rehearsed.*

THe Doctor is very prodigall of his pitie, when he cries out, *Who can but pitie the vertuous Epicurus, who is commonly conceived to place his chiefe felicity in pleasure and sensual delights, &c. But these pleasures were of the mind, not of the body.* *Gassendus* indeed hath taken much needlesse pains to vindicate *Epicurus* from his errors and impiety; but in this he washeth a Brick, or Blackmore: his chiefe supporter is *Diogenes Laertius*, an obscure Authour in former times: for no ancient Writer speaks of him; and he cites more Philosophers then (it's thought) he ever read. This *Laertius* lived 450. years after *Epicurus*, that is, in the time of *Antonius pius*, about 150. years after Christ; whereas *Epicurus* lived almost 300. years before our Saviour. Now how he should come to know more of *Epicurus* then those Philosophers who were contemporary with him, even his own disciples, who writ the life and doctrine of that wanton garden Philosopher; is a thing to be questioned, and to indifferent men improbable: For whatsoever *Gassendus* out of this *Laertius*, writes of his commendations, yet we find in the writings of ancient Philosophers among the Gentiles, and primitive Doctors among the Christians, that he was a man lewd in his conversation, and monstrous in his opinions; so that ever since he opened his Schoole till this day, a wanton Atheist is called an Epicure. *Sine vano publica fama.* Sure there could not be so much smoke without some fire; and to say that his contemporary Philosophers, chiefly the Stoicks, should out of malice write untruths of him, is very improbable: For to what end should they doe so? And why more against him then any other? Besides, if he was innocent, why did he not vindicate his own reputation by writing? Why did not his Scholars stand up in

his defence, how came it that in almoſt five hundred years he was branded by the tongues and pens of all men, and no man all that while ſtood up to cleare his reputation, till *Diogines Laertius* produced three of his Epiſtles, which wiſe men may think to be fictitious; and the rather becauſe they contradict what his own Scholars, and ancient Philoſophers have recorded of him. For *Timecrates* his beloved Diſciple, and one whom he made one of the Executors of his laſt will, writes, that with exceſſe of eating and drinking he uſed to vomit twice a day. And *Laertius* himſelf is forced to confeſſe, that he killed himſelfe in the Bath with drinking too much ſweet wine, and ſo he ſhewed himſelfe to be *Epicurus* indeed. He was ſo decrepid the later part of his life, that for many yeares together he could not riſe out of his chaire, he had ſo enervated his body with pleaſures, wherein he placed his felicity. Is this the Doctors vertuous *Epicurus*, who ſpent every day a *Mina*, which was an hundred *Drachma's*, that is, 3.l.2.s.6.d. every *Drachma* being 7.d.ob. I confeſſe onely *Seneca* among the Stoicks ſpeaks favourably of *Epicurus* his opinion concerning pleaſure, as if he meant of mentall delights (*lib.* 1. *de vit. beat.*) yet withall checks him, ſhewing that his commending of pleaſure was pernitious, becauſe voluptuous men upon this took occaſion to hide their luxury in the boſome of Philoſophy, and to cover their wantonneſſe with the patrociny and mantle of pleaſure: Therefore elſewhere he calls him, The Maſter of pleaſure, and one who too much yeelded to the delights of the body. *Seneca* therefore by ſpeaking favourably of *Epicurus*, would keep off voluptuous men from making him their patron of ſenſual pleaſures; and was loath that the ſacred name of Philoſophy ſhould be beſpattered by ſuch an impious profeſſor: His intention in this was good, but yet truth ſhould take place. Neither doth the honour of a holy profeſſion depend upon the quality of the profeſſor; though wicked *Judas* was an execrable Apoſtle, yet the Apoſtolicall function is ſacred. But perhaps it may be objected, That *Epicurus* did oftentimes uſe to faſt, and content himſelf with bread and water. I anſwer, That there is a pleaſure ſometimes in faſting, as well as in feaſting: the nature of man delights in change; if it were not for abſtinence ſometimes, we ſhould not know the delight of fulneſſe; darkneſſe commends the pleaſure of light, and Winter adds to the delights of Summer. There is a wearieſomneſſe in continuall feaſting, which takes away pleaſure. therefore *Epicurus* to maintain an alternate viciſſitude of delights, would interchangeably

changeably fast and feast. But his abstinence was to increase the pleasure of his intemperance; and his intemperance was to add delight to his abstinence. Beside that, he was necessitated sometimes to fast for his healths sake, and enjoyment of a long life, which could not consist in continuall surfeiting. *Seneca* (*in Epistol.*) also reproves *Epicurus* for his inconstancy in saying, That vertue is never without pleasure; and yet affirms that it is not the vertue but the pleasure that makes a man happy. A foolish distinction saith he: For if Vertue be never without that which makes a man blessed, then vertue it selfe is sufficient to beatitude, and that perfectly; for otherwise an imperfect felicity is infelicity. Again, in his Book of Benefits he tells *Epicurus*, That vertue is to be desired for its selfe, not for its pleasure, which he proves out of his own Doctrine of God: though he hath disarmed him of all power, excluded him from all commerce and care of Man, yet he worships him for his greatnesse and goodnesse, though he have no benefit by him, nor is afraid of any hurt from him. Again, he commends many of *Epicurus* his sayings, not because they were his, but because they were common Principles and Tenents used by him, *Non quia Epicuri voces, sed quia publicæ.* Another reason he gives, because some sayings are rare and unexpected out of his mouth, whose doctrine and practice was so lascivious: and therefore he commends his sayings more then his actions: he says he was *fortis, sed manuleatus*, a brave man, but with all debauched and effeminate; brave in his sayings, but debauched in practice. *Ignava opera Philosopha sententia.* As there be too many like him, Stoicks in opinion, and Epicureall in conversation; by nature saith the Comick, we are all prone to pleasure & lasciviousnes, *à labore proclives ad libidinem.* *Arcesilaus* being asked why so many of other Sects revolted to *Epicurus*, but none fell from him to them, answered, That Cocks can be easily made Capons, but Capons could never become Cocks again. It is easie to become and turn a Priest of *Cybele*, but not so easie to return. *Facilis discensus Averni, sed revocare gradum, superasque evadere ad auras, hoc opus hic labor.* Broad is the way that leadeth to destruction, but the gate to salvation is narrow, and few enter thereat. *Seneca* also checks that Master of the Revels for saying, In contented poverty there is much honesty: For how can he be poore that is content? It is content that maketh rich, discontent poore. He plainly bids defiance to *Epicurus* his opinion of pleasure, in his fourth book of Benefits, calling his Sect effeminate, umbratick, trencher Philosophers, making ver-

tue the hand-maid to pleaſures, which ought to be the Miſtreſſe, enſlaving her to her Vaſſals, which ſhe ought to lead, to command, to keep under; he calls it a manifeſt blindneſſe in them to ſet the Cart before the Horſe, to prefer pleaſure before Vertue, to ſet that firſt which ſhould be laſt: And not onely is he angry for advancing pleaſure, but for joyning it with Vertue at all, which ſcorns pleaſures, and accounts them her enemies, deſiring rather the acquaintance and familiarity of pains and labour, then of ſuch an effeminate happineſſe as pleaſure. Now that theſe pleaſures of *Epicurus* are not mental, but corporal, the ſame *Seneca* (whom the Doctor cities for his defence) makes it appeare in the 13. Chapter of the ſame book; Your pleaſure, O Epicurus, ſaith he, is to accuſtome your tender bodies to dull idleneſſe, to a ſleepy ſecurity, in the heat to delight your ſelves in cold ſhades, to ſolace your drooping ſouls with wanton thoughts, and to cram your laſie karkaſſes with good meats & drinkes in your ſhady gardens. Any man therefore may ſee that *Epicurus* his God was his belly, and gormandiſing his chiefe happineſſe. Wherefore *Athanæus*, *lib.* 7. ſhewes, that he flattered *Idomeneus* and *Metrodorus*, τὴς γαςρὸς ἕνεκεν, for his bellies ſake. The ſame *Seneca* alſo rejects *Epicurus* his impious opinion of God, whom he makes as idle as himſelfe, ſitting in another world ſecure and careleſs of humane affaires, acting nothing at all, which is *Epicurus* his chiefe happineſſe, and taking no notice of our injuries and benefits. If this were ſo (ſaith he) the world had been made to ſolicite ſuch deafe and impotent Deities with vowes, ſupplications, and lifting up of hands: Thou O *Epicurus* (ſaith he) haſt diſarmed God, and taken from him all his darts and power, ſo that he is not to be feared of any; thou haſt ſecluded him from this world by a wal or rampire, ſo that he can neither ſee nor feel what is acted here. Hence then it is plain, that *Seneca* was no ſupporter of *Epicurus*, though he commends ſome of his moral ſentences, not becauſe they were his, but becauſe they were common; and what greater commendation is it for him to ſpeak ſome good ſentences, then for the Devil to utter Scripture phraſes. Laſtly, *Seneca's* commendations, (if any ſuch be) of *Epicurus*, are of no great moment, ſeeing with him he doubts of the ſouls immortality; when he ſaith, *Illa quæ nobis inferos faciunt terribiles fabula eſt, &c.* Conſ. ad Marcian.

II. But that we may have a more full view of this ſwiniſh Philoſopher, whom the Doctor commends for his vertue, long life, and many books, we wil poynt at ſome of his abſurd and impious

impious tenents, that *Gaſſendus*, and other phantaſtical heads of this wanton age, may ſee what a goodly School of Philoſophy they would open here in Chriſtendome. 1. He rejects Logick, calling it, as *Laertius* tells us παρέλκσαν, ſuperfluous, or prepoſterous, whereas it is the moſt uſefull of all human Arts or Sciences; for without Logick we can neither define, nor divide, nor diſtinguiſh, we can neither tel the eſſential nor accidental differences, nor identities of things; we can neither diſcourſe or reaſon, ſpeak or write methodically, we can inferre no concluſion from any premiſes, nor find out probable and demonſtrative arguments for proof of any thing, nor detect the fallacies and captions that are in mens diſcourſes. But it is no wonder he denys the Art of Reaſoning, who knew not what Reaſon was; for he confounds it with the ſenſes, as if it had its eſſence and being in and from them. And in his Epiſtle to *Phythocles*, he would not have his happy men to meddle with any knowledge or diſcipline at all. 2. He makes a difference between τὸ πᾶν, the Univerſe and the World; affirming that there is but one Univerſe, but innumerable Worlds ſubject to continual generation and corruption; a poſition repugnant to Divinity, Philoſophy, ſenſe and reaſon. 3. He makes a certain ſpace between his worlds, which he cals μετάκοσμιον, *Tully* tranſlates it *intermundium*, there he places his idle and careleſſe Gods ſleeping ſecurely, as not being troubled with noyſe, tumblings and clamours of this tumultuous world. 4. He ſaith that the Sun, Moon and Starres were made a part by themſelves, καθ' αὑτὰ, and afterward were palces in this. 5. He will have the juſt magnitude of the Sun and Starres to depend upon our ſenſes, and to be no bigger then they ſeem to our eye; ſo that the bigneſſe of the Sun cannot exceed a foot. 6. He tels us that the Sun every night periſheth, and every day is generated. 7. He acknowledgeth no other happineſſe then what conſiſts in the pleaſure of taſting, ſmelling, ſeeing, hearing, feeling, or venery, as may be ſeen in *Laertius*. 8. He makes all things to have their exiſtence not by providence, but by hap-hazard of Atoms, and not the bodies of things onely, but the reaſonable ſouls of men alſo, which he makes ſubject to uncertainty. 9. He makes all the Gods ἀνθρωποειδεῖς, with humane ſhapes. 10. He teacheth, as *Plutarch* tels us, that there is no qualities in things, but what the ſenſes apprehend; ſo that the ſame wine may be both ſweet and ſoure, according to the palat that taſts it; and hot water is not hot but coole, if a man conceit it to be ſo. 11. He makes his doctrine fit for all mens humours; he commends

wealth to the covetous, diſcommends it to the prodigall and riotous; he praiſeth gormondiſing to the Glutton, diſpraiſeth it to the abſtenious: he tells the continent venery is hurtful, but to the wanton that it is delightful and pleaſant. 12. He ſheweth himſelf to be a prophane Atheiſt in deſpiſing Religion, making it a tyrant to keep men in aw, a pernitious device and a ſcar-crow to terrifie and enſlave the world. And now leſt any might think that *Epicurus* is wronged, and that theſe damnable opinions are fathered upon him cauſleſly, I will not alledge *Cicero*, *Plutarch*, *Lactantius*, and others that have profeſſedly written againſt him, but his prime Scholar *Lucretius*, who highly commends him, as being the firſt that freed the World from the bondage and ſlavery of Religion: His words are theſe:

Humana ante oculos fœde quum vita jaceret
In terris oppreſſa gravi ſub relligione,
Quæ caput à cœli regionibus oſtendebat
Horribili ſuper adſpectu mortalibus inſtans:
Primum Graius homo mortales tendere contra,
Eſt oculos auſus, primuſq; obſiſtere contra:
Quem neq; fama Deûm, nec fulmina nec minitanti
Murmure compreſſit cœlum, &c.

And ſo he goes on, glorying in the conqueſt and victory that *Epicurus* had got over religion, *Quare relligio pedibus ſubjecta viciſſim obteritur, nos exæquat victoria cœlo.* His other wicked and abſurd opinions, you may ſee mentioned and commended by the ſame Poet through all his Poem; ſo that the Doctor hath no reaſon to complain that *Epicurus* is wronged, and much leſſe cauſe hath he to commend and pity ſo prophane and abſurd a Writer, & to call him vertuous who was the greateſt enemy that ever vertue had. Neither are his many Writings, or long life, arguments ſufficient to prove him an honeſt man. I ſhall not need ſpend time and paper in refuting the ſenſleſſe and wicked Dictates of *Epicurus*, being fully refuted already by divers eminent Writers, both Chriſtians and Gentiles.

CHAP.

CHAP. XVII.

Epicurus *his Atomes rejected by nineteen reaſons.*

BEcauſe the Doctor ſpeaks oftentimes in his Book of Epicurean Atomes, which firſt were hatched in the brains of *Leucippus*, then entertained by *Democritus*, and by him recommended to his Scholar *Epicurus*; and becauſe ſome giddy heads of this age loathing wholſome doctrine, deſire to embrace any traſh, like women troubled with the *Pica*, who preferre aſhes, chalk, coals, tarre, and ſuch like ſtuffe, to nouriſhing meats. I will propoſe to the Readers view, the abſurdities of this whimſical opinion concerning Atomes, that they may ſee how little reaſon there is to fil young brains with ſuch empty phantoſms, and to reject *Ariſtotles* wholſome and approved Doctrine of Principles. The inventers of theſe Atomes at firſt, out of a vain-glory that they might ſeem ſingular, rejected the common received principles of naturall Bodies, obtruding on the World their idle dreams; which are greedily embraced by the vain-glorious wits of this age, but upon what grounds let us ſee: 1. Either many bodies are made up of one atome, or one body of many atomes. But neither are true; not the firſt, becauſe an atome is indiviſible; not the ſecond, becauſe they cannot unite together in reſpect of vacuity in which they are diſtant from each other. 2. It is a maxime among them (ſaith *Ariſtotle*) That there is no paſſibility but by the means of vacuity. Now atomes have no vacuity in them, becauſe they make them ſolid, therefore they are not ſubject to paſſibility; it will follow then, that where there is no paſsion, there can be no action; for paſsion is the reception of action, and therefore where no patient is, there no agent can be, becauſe that is wanting on which the agent ſhould act. Hence it will follow, that where there is no action and paſsion, there can be no generation. 3. There can be no action where there is no contrariety; but contrary qualities are not in atomes: for *Leucippus* (as *Ariſtotle* ſaith) placed heat in them, but not cold; hardneſſe, but not ſoftneſſe; gravity, but not levity. 4. Theſe Atomiſts contradict themſelves: for they hold their atomes impaſsible, and yet place in them degrees of qualities, making ſome heavier then others; by which it will follow, that ſome atomes are hotter then others, and conſequently they cannot act one upon another: For the greater heat acts upon the leſſer,

leſſer, as the ſtronger upon the weaker. 5. If compounded bodies are made up of atomes, then the qualities which are in theſe bodies, were firſt in the atomes, or were not; if not, whence have compounded bodies their qualities, being they are not in their principles? If they are in atomes, either they are ſingly, ſo that in each atome there is but one quality, as frigidity in one, hardneſſe in another; or elſe there be divers qualities in one atome. If the firſt be granted, then it will follow, that each atome hath a different nature from the other, and ſo no poſsibility for reception of the quality of another, and conſequently no action; if the ſecond be granted, then it will follow that atomes are diviſible: for there muſt be one part for reception of one quality, and another part for the other quality. There muſt be alſo beſides, integrall parts, matter and form, act and paſſibility, which we call eſſentiall parts; ſo will it follow, that atomes are compounded bodies, which cannot be principles. 6. The uniting of theſe atomes muſt be either by themſelves, or by another; if by another, then they are paſſible, which is repugnant to *Democritus*; if by themſelves, then they are diviſible into parts, to wit, into the parts moving, and the parts moved: For nothing can move it ſelfe; becauſe contrarieties cannot be in the ſame thing *ſecundum idem*. 7. They make ſome of the atomes to be ſoft; it will follow then, that ſome of them are paſſive: for ſoft things are apt to receive impreſſions, and ſo to ſuffer. 8. If theſe atomes be ſmooth and round, as ſome will have them, they can no more unite to make up a mixt body, then ſo many ſmall ſeeds or grains, which onely make up a body aggregate, as a heap of ſtones; but if they be rough, cornerd, or hooked, as others ſay, then they are diviſible, and ſo not atomes. 9. If there be innumerable worlds, as *Epicurus* holds, and innumerable atomes muſt concurre to make up any one of theſe Worlds, how many innumerable atomes are there to make up innumerable Worlds? There muſt needs be more atomes then Worlds, and conſequently degrees of more and leſſe in innumerability and infinity, then which nothing can be more abſurd. 10. If all things are made of atomes, to what end was ſeed given to vegitables and animals for procreation? What needs the Husbandman ſow corn, or the Gardiner caſt his ſeeds into the ground? What needs he dig or plow, plant, & water, whereas all fruits, herbs and plants, can be produced by atomes? Birds, ſaith *Lactantius*, need not lay eggs, nor ſit upon them for procreation, ſeeing of atomes both eggs and bird

cans

can be produced. 11. The ſouls and their faculties are made of finer and ſmaller atomes then the bodies which are compounded of a groſſer ſort. It muſt then follow they have degrees of magnitude, and conſequently diviſibility. 12. Thoſe atomes have neither knowledge, reaſon, wiſdome, nor counſell, and yet can produce by hap-hazard, worlds and all things in them, which neither Men nor Angels can effect by their wiſdom. 13. If the ſtatue or picture of a man cannot be effected, but by art, reaſon, & wiſdom, what impudency is it, ſaith *Lactantius*, to affirm man himſelfe by chance to be made, or by a temerarious and fortuitall conglobation of atomes. 14. We ſee the World and the creatures therein governed, not temerariouſly, but by an admirable providence and wiſdome, how then can any imagine theſe ſhould be made by chance, and not by wiſdome. 15. I would know whether Towns, Caſtles, Temples, Ships, & other buildings, are made up of atomes? If theſe are not, how ſhall we believe that celeſtiall or ſublunary bodies, or the whole World ſhould be made of them. 16. When *Epicurus* gives to his atomes magnitude, figure and weight, hee makes them perfect bodies, and conſequently unapt for Phyſicall mixtion: For the uniring of perfect bodies makes up an aggregative body; ſo that in the generation of bodies there is no mixtion but aggregation, which is ridiculous. 17. Hee gives figures to his atomes, and yet makes them inviſible, which is a plain Bull and contradiction: For an inviſible figure is like an inviſible colour, an inaudible ſound, an inodorable ſmell, an unguſtible ſapor, an untangible hardneſſe. To make the ſenſes proper objects inſenſible, is a ſenſleſſe toy. 18. He makes his atomes move downward in a ſtraight line, by reaſon of their gravity; but fearing leſt by this motion there would never be any concurring of them for generation, he aſſignes them in another motion, which he calls declination, and ſo to one ſimple inviſible indiviſible body, he gives two motions, but tells us not the cauſe of this motion of declination, which as *Tully* ſaith, argues his groſſe ignorance in Natural Philoſophy: For I would know whether this motion be from an internal or external cauſe; not from an internall, for there is no other internal cauſe of the atomes motion downward, but gravity, which cannot produce two motions; the cauſe cannot be external, becauſe *Epicurus* his Gods doe not move or work at all: Beſide that, his Gods are alſo made of atomes, as *Cicero* ſhews. 19. Moſt ridiculouſly did he invent this motion of Declination, leſt he ſhould ſeem to deprive man of his liberty of will:

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For he thought mans will muſt needs be neceſſitated, if thoſe atomes of which the ſoul is made, ſhould have no other motion but downward, which is a naturall and neceſſary motion. And by the ſame means alſo he took away Fate or providence. Thus have I briefly touched the abſurdities of this opinion, which is ſo hugged, and greedily ſwallowed without chewing, by ſome unſetled and vain-glorious men, not regarding the dangerous conſequences ariſing thence, nor the impiety of the Authour, being both an Atheiſt and a prophane wanton, and unſetled in his opinions, ſaying and unſaying at his pleaſure: For when he ſaw the envie and danger he had brought upon himſelfe by his impious Dictates, he ſweetens them a little in effect, as *Tully* ſaith, denying all Divinity, and yet in words allowing Divine Worſhip, which is moſt ridiculous: to pray and praiſe, to feare and love, to ſerve and worſhip ſuch Gods as neither love nor hate us, ſuch as take no notice of our good and evill, ſuch as have no relation to us, nor we to them. So he palliates ſometimes his ſwiniſh pleaſures with the delights of the mind, clothing a foul Strumpet with the habit of a modeſt Matron; whereas by the delight of the minde, he meant nothing elſe but mentall thoughts, or the delightfull remembrance of his fleſhly pleaſures, which we leave to him and his Diſciples, *Epicuri de grege porcis.*

CHAP. XVIII.

1. *That Chryſtal is of water, proved, and the contrary objections anſwered: how it differs from Ice.* 2. *The Loadſtone moves not; its Antipathy with Garlick. Of the Adamant, Verſoria, Amber, &c.*

THat Cryſtall was at firſt Water, then Ice, and at laſt by extream cold hardned into a ſtone, was the opinion of the ancient Philoſophers, and of *Scaliger* the beſt of the Modern; but *Mathiolus*, *Cardan*, *Boëtius de Boöte*, and *Agricola*, with ſome others, will have it to be a Minerall body, hardned not by cold, but by heat, or a Minerall ſpirit. Of this opinion is the Doctor (*Book* 1. *Cap.* .) but his reaſons are not ſatisfactory: For firſt (ſaith he) *Minerall ſpirits reſiſt congelation, but Ice is water congealed by cold. Anſw.* He takes this for granted

granted which is not: For he is to prove Cryſtal a mineral, and that 'tis hardned by a mineral ſpirit, which he doth not. Again, all Minerals reſiſt not congelation, but further it ſometimes as he ſheweth himſelfe of Snow and Salt by the fire ſide turned into Ice, and of water converted into Ice, by Salt-peter. Beſides, all minerals are not hard; for Quickſilver is not, nor can mineral ſpirits harden their own bodies or keep them from diſſolving into liquor, it is the external heat or cold that doth it, not the internal ſpirit, as we ſee in Salt, which diſſolves into water if it be not hardned by the heat of Sun or fire, and ſo will Ice diſſolve into water, if the cold grow remiſs or the heat prevaile. If then a Mineral ſpirit cannot harden its own body, how can it harden the body of water? What mineral ſpirits are there in cold water to harden it into Ice? Spirits are hot, therfore apter to diſſolve water then harden it; but we ſee manifeſtly that it is cold and not ſpirits which cauſeth Ice: the ſame cold in ſome Caves where the Sun never comes, nor heat, converteth water-drops into ſtones, and the cold of ſome waters metamorphiſe ſtickes, leaves and trees, pieces of lether, nut-ſhels, and ſuch like ſtuffe into ſtones; why then may not cold convert Ice into a higher degree of hardneſſe, and prepare it for reception of a new forme, which gives it the eſſence and name of Cryſtall. 2. [A liquation in Cryſtal may be effected, but not without ſome difficulty; but Ice may diſſolve in any way of heat.] *Anſw.* The difficult melting of the one, and eaſie liquation of the other, wil not prove that Cryſtal was not Ice, but that it is not ice. For as *Scaliger* ſaith, *Valde à ſeipſo differt quod fit, dum fit, & cum eſt*, Ice before it attains the hardneſſe of a ſtone, or Cryſtall, is yet water formally, and Cryſtal onely materially, or in the way of preparation. But when it ceaſeth to be ice, it aſſumes the form of cryſtal, and wil not deny its original, that it was once Ice, which now is a ſtone. The matter then of cryſtal, is water, and it is made of Ice, becauſe it was water, by which Ice it hath ſtept up to the forme of a ſtone. 3. *They are differenced by ſupernatation, or floating upon water, for cryſtal will ſink, but ice will ſwim in water. Anſw.* Its no wonder to ſee a ſtone ſink, and ice ſwim; for cryſtal when it was ice, ſwimmed, being now a ſtone, ſinks; as being a body more compact, hard, ſolid, and ponderous: ſo a ſtick will ſwim, but when it is converted to a ſtone, it ſinks. The argument therefore is good thus: Cryſtal ſinks, Ice ſwims, therefore cryſtal is not ice; but it will not follow, therfore cryſtal was not ice.

4. *They*

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1. *That Chryſtal is of water, proved, and the contrary objections anſwered: how it differs from Ice.* 2. *The Loadſtone moves not; its Antipathy with Garlick. Of the Adamant, Verſoria, Amber, &c.*

THat Cryſtall was at firſt Water, then Ice, and at laſt by extream cold hardned into a ſtone, was the opinion of the ancient Philoſophers, and of *Scaliger* the beſt of the Modern; but *Mathiolus*, *Cardan*, *Boëtius de Boöte*, and *Agricola*, with ſome others, will have it to be a Minerall body, hardned not by cold, but by heat, or a Minerall ſpirit. Of this opinion is the Doctor (*Book* 1. *Cap.* .) but his reaſons are not ſatisfactory: For firſt (ſaith he) *Minerall ſpirits reſiſt congelation, but Ice is water congealed by cold.* *Anſw.* He takes this for granted

granted which is not: For he is to prove Cryſtal a mineral, and that 'tis hardned by a mineral ſpirit, which he doth not. Again, all Minerals reſiſt not congelation, but further it ſometimes as he ſheweth himſelfe of Snow and Salt by the fire ſide turned into Ice, and of water converted into Ice, by Salt-peter. Beſides, all minerals are not hard; for Quickſilver is not, nor can mineral ſpirits harden their own bodies or keep them from diſſolving into liquor, it is the external heat or cold that doth it, not the internal ſpirit, as we ſee in Salt, which diſſolves into water if it be not hardned by the heat of Sun or fire, and ſo will Ice diſſolve into water, if the cold grow remiſs or the heat prevaile. If then a Mineral ſpirit cannot harden its own body, how can it harden the body of water? What mineral ſpirits are there in cold water to harden it into Ice? Spirits are hot, therfore apter to diſſolve water then harden it; but we ſee manifeſtly that it is cold and not ſpirits which cauſeth Ice: the ſame cold in ſome Caves where the Sun never comes, nor heat, converteth water-drops into ſtones, and the cold of ſome waters metamorphiſe ſtickes, leaves and trees, pieces of lether, nut-ſhels, and ſuch like ſtuffe into ſtones; why then may not cold convert Ice into a higher degree of hardneſſe, and prepare it for reception of a new forme, which gives it the eſſence and name of Cryſtall. 2. [A liquation in Cryſtal may be effected, but not without ſome difficulty; but Ice may diſſolve in any way of heat.] *Anſw.* The difficult melting of the one, and eaſie liquation of the other, wil not prove that Cryſtal was not Ice, but that it is not ice. For as *Scaliger* ſaith, *Valde à ſeipſo differt quod fit, dum fit, & cum eſt*, Ice before it attains the hardneſſe of a ſtone, or Cryſtall, is yet water formally, and Cryſtal onely materially, or in the way of preparation. But when it ceaſeth to be ice, it aſſumes the form of cryſtal, and wil not deny its original, that it was once Ice, which now is a ſtone. The matter then of cryſtal, is water, and it is made of Ice, becauſe it was water, by which Ice it hath ſtept up to the forme of a ſtone. 3. *They are differenced by ſupernatation, or floating upon water, for cryſtal will ſink, but ice will ſwim in water. Anſw.* Its no wonder to ſee a ſtone ſink, and ice ſwim; for cryſtal when it was ice, ſwimmed, being now a ſtone, ſinks; as being a body more compact, hard, ſolid, and ponderous: ſo a ſtick will ſwim, but when it is converted to a ſtone, it ſinks. The argument therefore is good thus: Cryſtal ſinks, Ice ſwims, therefore cryſtal is not ice; but it will not follow, therfore cryſtal was not ice.

4. *They*

4. *They are diſtinguiſhed in ſubſtance of parts, and the accidents thereof, that is, in colour and figure, for ice is a ſimilary body, but the body of cryſtal is mixed, and containeth in it ſulphure, for being ſtruck with ſteel, it ſends forth ſparks, which are not cauſed by colliſion of two hard bodies, but they are inflamable effluences diſcharged from the bodies collided; for a ſteel and flint being both met, will not readily ſtrike fire. Anſw.* Cryſtal is not ſo much diſtinguiſhed either in ſubſtance or accidents, from ice, as a chick is from an egge, and yet the chick was an egg.

What wonder is it, if cryſtal having received a new form, be diſtinguiſhed from ice, whereas we ſee greater diſtinctions daily in our own nutrition, our bloud, fleſh, and bones, have neither the colour, figure, or ſubſtance of corn, fruits, hearbs, roots, and other meats we feed upon. In the ſame roſe-leaf there be diſtinct qualities and operations, one part being reſtringent, the other laxative; the ſame Rhubarb as it is differently prepared, differently worketh, one way by looſning, another way by binding the belly. Let us not deny that diſtinction to a natural, which we give to an artificial preparation; there are diſtinct colours in one and the ſame leaf of a gillyflower, or tulip. Again, when he ſaith, *That Ice is a ſimilary body, but Cryſtal is mixed*; Here is no oppoſition, for ſimilary and diſſimilary, are oppoſite. not ſimilary and mixed, for a ſimilary body may be mixed; ſo is fleſh, ſo is bloud, ſo is ice, except he will make it a pure element. And when he ſaith, *Cryſtal containeth ſulphure in it*; This is very unlikely, for ſulphure is hot and inflamable, it is alſo viſcous and fat, it is of a piercing quality and of an ungrateful ſmel, none of which qualities we finde in cryſtal. In fiery mountains there is moſt ſulphure, in ſnowy mountains, moſt cryſtal; but his reaſon to prove there is ſulphure in cryſtal, is invalid, becauſe ſaith he, *being ſtruck with ſteel, it ſends forth ſparks*; by this reaſon he may prove there is ſulphure in every hard thing, even in wood and ſticks, for by attrition, or any other violent motion, they are inflamable, as the *Americans* know, who uſe no other way to kindle their fires, bnt the attrition of ſticks. Arrows will burn in the air, their Lead will melt, bels, mil-ſtones, and cart-wheels, will grow extream hot with motion, and ſo wil water; is there ſulphure in all theſe? And here he contradicts himſelf, when he ſaith, *That the ſparks are not ſent forth by colliſion of two hard bodies, but they are inflamable effluences diſcharged from the bodies collided.* I would know how theſe effluences

can

can be diſcharged, if the bodies be not collided, and how they can bee collided without colliſion. Theſe ſparks then are doubtleſſe the accenſion of the aire, and aerial parts of theſe hard bodies, by motion and colliſion, being no way hindered by wetting the Steele and Flint, for I have tried the contrary by werting both, and yet the Sparks fly out as readily, as if both had been dried; ſo they will out of Flints taken out of Rivers, where they have been perpetually moiſt, ſo that the ſparks are not quenched at their eruption, becauſe the air is not wet, though the Steel and Flint be. 5. *They are* (ſaith he) *differenced in the places of their generation; For Cryſtall is found in Regions where Ice is ſeldom ſeen Anſw.* It is ſufficient that in thoſe Regions where Cryſtall is found, Ice is ſometimes ſeen; and as Ice is there but ſeldome ſeen, ſo Cryſtal is there but ſeldome found: The beſt and greateſt quantities are found in cold and ſnowy Countries. Again, though in thoſe hotter Countries the air above is warm, yet in the bowels of the earth it is as cold, or rather colder, then elſewhere by antiperiſtaſis; and that is ſufficient to prove Cryſtal may be there generated. 6. *They have contrary qualities elementall, and uſes medicinall. Anſw.* It is true, Ice is moiſt, and Cryſtall dry: ſo water is moiſt, and ſalt is dry; will it therefore follow, that ſalt is not generated of water? Allum, Salt-peter, Vitriol, are all hard and dry, ſo are the bones in our fleſh, the teeth in our gums, the ſtones in fruits, yet all are begot of ſoft and moiſt materials. As for their contrary medicinall uſes, I queſtion not, whereas there are in one and the ſame ſimple (as I ſhewed but now) contrary effects.

II. In the 2, 3, and 4 Chapters of the ſecond book, the Doctor hath divers pretty and pleaſant Diſcourſes of the Loadſtone and Amber, yet to ſome paſſages I cannot aſſent; as 1. when he ſaith, *There is coition, ſyndrome, and concourſe of the Load-ſtone and Iron to each other*; For I doe not think that the ſtone is moved at all to the Iron, for every naturall motion hath its reaſon and end; the end of attraction in animals and vegitables is for aliment: the motion of ſtones and other heavy bodies downward, is to enjoy their Matrix, or Center: but no end can be aſſigned why the Loadſtone ſhould draw or move towards the Iron. the motion therefore is in the Iron, and other metals, which are moved to the Loadſtone, as to their Matrix, ſaith *Scaliger*; therefore it is no more wonder for Iron to move to the Loadſtone, then to move downwards, the end and efficient cauſe being the ſame in both motions, to wit,

wit, the enjoyment of their proper place or matrix. 2. Whereas the ancients held that garlick hindred the attraction of the Loadſtone, he contradicts this by experience; but I cannot think the ancient Sages would write ſo confidently of that which they had no experience of, being a thing ſo obvious and eaſie to try; therefore I ſuppoſe they had a ſtronger kind of garlick, then is with us, which made *Horace* write ſo invectively againſt it, calling it poiſon and worſe then hemlock. 3. He denies the vertue of the Adamant in hindring the Loadſtones attraction, which the Ancients affirm. It ſeems our diamonds have not this vertue, but this is no ſufficient reaſon to deny the vertue of the Adamant, for though our diamond be a kind of Adamant, yet it is not that kind which the Ancients ſpeak of; for *Pliny* reckoneth ſix kinds of Adamants. 4. He takes *Verſoria* in *Plautus*, with *Turnebus*, for the rope that turns about the ſhip; but if *verſoria* there ſignifies a rope, it muſt be falſe Latine, for *funis* muſt be underſtood, therefore *Plautus* would rather have ſaid *verſorius*; but I rather take it with *Joſeph Scaliger*, upon *Manilius*, and with *Pineda*, for a turning back and taking the contrary way: ſo that it is an adjective, and *via* is to be underſtood; the ſame phraſe *Plautus* uſeth in *Trinummi*, when *Staſimus* bids *Charmides* return to his maſter, *cape verſoriam recipe te ad herum*; or elſe *verſoria* is taken for the helm by which the ſhip is turned about. 5. *He will not have amber a vegitable, but a mineral concretion, as is delivered by* Boetius. *Anſw.* *Boetius* delivers, that there are three ſorts of Amber, to wit, minerals, animals, and vegitables, the firſt is begot of a bituminous exhalation or oil; the ſecond of the fat of animals, the third of the gum of trees; he tels us alſo that becauſe oftentimes in Amber are found ſpiders, flies, and other inſects, with pieces of ſticks and ſtraws, which the gum falling from the trees, might lick up, or involve. That all Amber is vegitable, and the juice of trees, even that which is gathered in the ſea, becauſe ſaith he, much land hath been drowned by the ſea, and gained from the ſea again, as he ſhews of the *Netherlands*. *Cardan* denies not but all Amber is the juice of trees, yet made bituminous by the heat of the ſea; and *Salmuth* upon Pancerol, tels us, that the Ancients called that only Amber, which diſtilled from the trees, whence Saint *Ambroſe* cals it the tears of the ſhrub; therefore though it be thickned by heat or cold, or the ſea-water, it is not therefore to be called

led a Minerall, but a Vegitable, as having its originall and eſſence from Vegitables. *Scaliger* writes, That there is a kind of black Amber gathered in thoſe Seas where there is greateſt ſtore of Whales; and therefore Amber is called Whale by the inhabitants of *Morocco* and *Fez*, as believing that it is a ſubſtance proceeding from the Whale: But whether it be true Amber, may be doubted, and I do not find that among the Ancients *Succinum* ſignified any thing elſe, but the Gum of Trees, concrete into a ſolid ſubſtance, and of this mind is *Petrus Belonius*, in his Obſervations.

CHAP. XIX.

1. *The Navigation of the Ancients by the ſtars: they knew not the compaſs.* 2. *Goats bloud ſoftneth the Adamant. Gold loſeth its vertue and gravity with its ſubſtance. Iron may grow hot with motion. Coral is ſoft under water, and hardned by the air. Viſcum or Miſsletoe, how it grows. The ſhade of the Aſh-tree, pernicious to Serpents.*

IT *is not probable* (ſaith the Doctor) *That the long and ſundry voyages of elder times, were performed by the help of Starres.* It is ſo farre from being improbable, that there was a neceſſity they ſhould be directed by the Starres, wanting the uſe of the Compaſſe; therefore *Palinurus* in the Prince of Poets, is ſtill deſcribed obſerving the ſtarres in his Navigation, *Sydera cuncta notat tacito labentia cœlo*, *Æneid.* 3. And, *Oculoſque ſub aſtra tenebat*, *Æneid.* 5. And in his *Georgicks*, he ſheweth, That the Sea-men were the firſt that made uſe of the ſtarres, and gave them names, *Novita tum ſtellis numeros & nomina fecit, Pleiades, Hiados, clarumque Lycaonis Arctον.* So *Seneca* ſheweth, That before Navigation, there was no uſe of Aſtronomy, *Nondum quiſquam ſidera norat.* And *Flaccus* tells us, That *Typhis* directed his courſe altogether by the ſtarres. *Pervigil Arcadeo Typhis pendebat ab aſtro: Agniades Fœlix ſtellis qui ſegnibus uſus.* So *Horace* wiſheth, That *Venus*, *Caſtor*, and *Pollux*, thoſe cleare ſtarres, might direct the ſhip in which *Virgil* was, *Sic te diva potens Cypri*, *&c.* The leſſer Beare, called *Arctophylax* by the Grecians, and *Cynoſura*, or dogs tail; and by ſome *Phœnice*, was altogether obſerved by the *Sidonians*, or *Phœnicians*, the firſt

and chiefeſt Navigators we read of, the greater bare called Helice, directed the *Græcians* in their Navigation. The grounds and rudiments of this art was firſt laid by *Noah*, afterward his poſterity perfected it by induſtry and obſervation, marking how fiſhes did ſwim, and birds flie, ruling their motion with their tails, and furthering it with their wings and finns, whence we have the uſe of Helms and Oars, or ſails; therefore in Hebrew *tziim* ſignifieth both a bird and *ſhip*, and in Latin *n* put to *avis*, makes *navis*. The perfection of this art is now in this laſt age attained to by means of the compaſs unknown to the Ancients whoſe Navigation was along the Coaſt, as we know by the voiages of *Æneas* and *Paul*, who for want of the compaſs durſt not venture into the Ocean, as we do. In the voiage of *Jonas*, and others, we find they uſed Oars moſt commonly; by the Navigation of *Paul*, we learn that ſounding the coaſt was much uſed; yet we read that the Ancients ſailed in the Ocean: but by this word we muſt underſtand the Mediteranean ſea, called by the Pſalmiſt the great and wide ſea, and by *Virgil*, *mare magnum*, *Æn.* 5. or elſe the ſkirts and brim of the Ocean; for they knew no other Navigation, then along the coaſt, as we ſee by the voiage of *Hanno*, from *Calez* to *Arabia*, and of *Eudoxus* from the bay of *Arabia* to *Calez*, and the Fleet of *Auguſtus* which ſailed Northward; for they neither durſt, nor could with ſafety venture too far into the Ocean, without the compaſſe, the want of which, made *Solomons* ſhips ſpend three years in their voiage, which might have been effected in three moneths; they entred alſo into moſt Creeks and Harbors by the way, to finde out rarities for *Solomon*. This admirable ſea-guide was found out by one *Flavius* at *Melphis*, in the kingdome of *Naples*, above three hundred years ago, as *Blondus*, *Pancerol*, and others affirm. *Pliny* ſpeaketh of the *Magnes*, or loadſtone, but makes no mention of this vertue to turn the iron touched therewith to the pole, nor in reciting the inſtruments of Navigation, doth he ſpeak a word of this. In no ancient Writer do we find this vertue mentioned, nor ſo much as a name for it in Hebrew, Greek, or Latin, neither do they mention the touching of their ſun-dials with it; beſides, *Pliny* ſaith, the Iſlanders of *Taproban* or *Sumatra*, becauſe they cannot ſee the North, carry with them in their ſhips certain ſmall birds, which being let looſe, by naturall inſtinct fly to the Land, whether the Mariners direct their courſe after theſe guides; this ſheweth they were ignorant of the compaſs, as *Acoſta*, *Gomara*, *Pance-*

Pancerol, *Salmuth*, and others do prove. The *Phœnicians* and *Sidonians* were anciently the experteſt Navigators of the world, yet we find not that they had any knowledge of the compaſs: the *Carthagineans* indeed by ſea viewed all the coaſt of *Mauritania*, yet they kept cloſe by the ſhore; and though ingenious men did live in old times, and were inventors of many rarities, yet ſome things they have left for poſterity to finde, whereof they were ignorant, as Clocks, Guns, Printing, &c. therefore the reaſons of *Lemnius* are weak, who thinks the Ancients knew the compaſs, and no leſs infirm is the argument of *Pineda*, taken from *Solomons* knowledge of all things; for this word (*all*) in Scripture, is taken for many, and many is taken for all: So Chriſt cured all diſeaſes, in S. *Matthew*, that is, many; ſo all of thoſe that ſleep in the duſt of the earth, ſaith *Daniel*, ſhall ariſe, that is, many. *Solomon* then knew all things, that is, moſt things and more then other men; but I do not think he knew the compaſſe or all the ſpecies of animals, vegitables, minerals, people and places, that are found at this day in *America*, nor all the arts invented ſince, nor all the ſupernaturall works of God. His chief knowledge was politicall, for government; he knew not the future contingencies, nor all the ſecrets in the earth and ſeas; if he knew the polar verticity of the Loadſtone, then *Adam* alſo knew it, for his knowledge far exceeded *Solomons*, he gave names to all the creatures according to their natures; he lived 930. years, a fair time to get experience; yet though *Adam* knew this, it will not follow that the compaſs was uſed in his time, or in *Solomons* either, who knew that Copper and Braſs did ſound well, yet Bels of Copper were not uſed in his time; and whereas *Pineda* ſaith, that God would not have ſo uſeful a thing as the compaſs, hid from man ſo long. I anſwer, that Printing is no leſs uſeful, which was not known till of late. What was more uſefull then the Preaching of the Goſpel, and Incarnation of Chriſt, and yet hid many thouſand years from the world? God hath his own times to beſtow his gifts on men; for that fable of ſhips built without iron, for fear they ſhould be ſtaied in the ſailing by the great ſtore of Loadſtones neer *Calicut*, is ridiculous; for our *European* ſhips are continually trafficking that way, and they perceive no ſuch things. To conclude then, ſhips of old were guided, being out of ſight of Land, not by the compaſſe, but partly by the Tides, partly by the Windes, and partly by the Stars, and Sea-birds; and when all theſe failed, they wandred

up and down, not knowing where they were, as we ſee in *Æneas* his Navigation, *cæcis erramus in undis, nec meminiſſe viæ media Palinurus in unda*; the like we may read in Saint *Paules* voiage,

II. The Ancients held that Goats bloud could ſoften the Adamant, and yet reſiſt the hardeſt hammers; this is denied by the Doctor (2 *Book* c. 5, 6, 7.) and his Lapidaries: but their argument is not Logical; our Diamonds are not ſoftned by Goats bloud, but are maſtered by hammers; therefore the Ancients Adamants were ſuch. All Adamants are not of the ſame kind, for *Pliny* as we have already ſaid, reckoneth ſix ſorts of them; and I think it is no greater wonder for bloud to ſoften a ſtone, then for water to harden a piece of Leather, or a ſtick into a ſtone. 2. He ſaith, [that though the ſubſtance of Gold be not ſenſibly immuted, or its gravity at all decreaſed, yet from thence vertue may proceed; for a body may emit vertue without abatement of weight, as is evident in the Loadſtone.] *Anſw.* An accident without a miracle, if it be the ſame numerically, cannot paſs without the ſubſtance in which it is inherent, nor can the ſubſtance be diminiſhed but the gravity muſt alſo be abated. Therefore if Gold in the Patients body loſeth nothing of its ſubſtance and gravity, it loſeth no part of its vertue: if the loſs be inſenſible, the vertue communicated to the patient is inſenſible alſo; and ſo he that ſwallows gold receives no good by it: For where there is a cure, there muſt be a ſenſe and feeling of the cure. As for the Loadſtone, if it imparts its vertue, it parts alſo with its ſubſtance, but in ſo ſmall a quantity that its ſcarce perceptible; but the gold ought to impart much vertue to cure the diſeaſe, and conſequently much of its ſubſtance, which would be ſeen by the weight and the cure; but neither is ſenſible, and therefore no deperdition, but imaginary. 3. He cannot apprehend how an iron ſhould grow red hot by motion, ſince in ſwinging a red hot iron, it wil grow cold. *Anſw.* That violent motions will excite heat and fire in hard bodies, we have already ſhewed in divers examples; *Ariſtotle* proves it by the example of Arrows, whoſe Lead will melt with the heat and motion thereof, in that part of the air, which is near the fire (*de cœlo*, *l.* 2. *c.* 7.) *Virgil* confirms the ſame, ſpeaking of that Arrow which *Aceſtes* ſhot, that it took fire in the motion. *Namque volans liquidis in nubibus arſit arundo, ſignavitque viam flammis*, *Æn.* 5. but when he ſaith that hot iron will grow cold by ſwinging, I grant it, becauſe that heat in the iron is meerly accidental, and from

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an external principle, it wants pabulous aliment in the iron to maintain it; therefore no wonder, if encountring with the cold air, it extinguiſh: but take a bran or ſtick of fire, and ſwing it about, it will grow redder, hotter, and more fiery, becauſe there is not the bare accident of heat; but the ſubſtance of fire, which is animared and quickned by the motion of the air; neither is it ſtrange if the violent motion of an Arrow in hot weather, and in that part of the aire which is neer the fiery element, take fire, where we ſee ſo many fiery Meteors ingendred. But he ſaith, *that a bullet ſhot at paper or linen, will not ſet them on fire*; it may be ſo, becauſe the bullet is not hot enough, having moved but a little way, and a ſmal time; you cannot in a long time make paper or linen burn, be the fire never ſo hot, except they touch the flame. 4. He will not believe that Coral is ſoft under water, and hard in the air, *becauſe one who went down a hundred fathom into the ſea, returned with Coral in each hand, affirming it was as hard at the bottom, as in the air.* *Anſw.* *Boetius* in his ſecond Book of ſtones and gems, *c.* 153. tels us, that Coral doth not harden or grow ſtony till it be dead; it ſeems then, whilſt it is alive, its ſoft under water, and therefore this Diver lighted upon a dead Coral; but becauſe that was hard, it will not follow that all Coral under water is hard, except all under water be dead. There is alſo a difference between old and young plants, the older the plant grows, the harder it is; perhaps this was not only dead but alſo an old plant: Its no wonder then if Coral petrifie when taken out of the ſea, for then it dieth being ſeparated from its matrix and element, in which it had life and vegetation; and it ſeems by the ſame *Boetius*, that the ſubſtance of Coral at firſt is wood, for he ſaw ſome which was partly wood and partly ſtone, not being throughly petrified, which might proceed from ſome internal impediment: it is therefore no more wonder for a ſea-plant to petrifie in the air, then for a land-plant to petrifie in the ſea, or other waters. This is called in Greek λιθόδενδρον, as you would ſay ſton-tree, or ſtone-plant, and κωράλιον, *quaſi* χειράλιον, becauſe it petrifieth when it is touched by the hands, and becauſe the *Gorgons* were turned into ſtones, therefore in *Pliny*, Coral is called *Gorgonia*. 5. He likes not the opinion of the Ancients, concerning the generation of Viſcum or Miſſeltoe, to wit, that it is bred upon trees from ſeeds let fall there by thruſhes, and ring-doves; his reaſons are, *becauſe it grows only upon ſome trees, and not in* Ferrara, *where theſe birds are found, and becauſe the ſeed thereof being ſown, it*

will not grow again, and in ſome trees it groweth downwards under the boughs, where ſeed cannot remain. Anſw. That Viſcum is begot of ſeeds let fall by birds, as the Ancients thought, may be true, and that it is an excreſcence of viſcous or ſuperfluous ſap, as *Scaliger* writes, may be true alſo. Many things are procreated both with and without ſeeds; there is an equivocall generation both in vegitables and animals, which the learned Poet knew when he writ of this Viſcum, ſaying, *Soletfronde vivere nova quod non ſua ſeminat arbos.* Now the reaſon why it groweth not upon all trees, and in all Countries, is, becauſe as the ſame Poet ſaith, *Non omnia fert omnia tellus*, there is not a diſpoſition in the matter of all trees to receive this form, nor in the climate or ſoile to animate this ſeed. Yet *Mathiolus* obſerves, that in *Hetruria*, where is greateſt ſtore of Thruſhes, there is greateſt pleny of Miſſeltoe, which ſhews, that this plant hath its originall from the ſeeds mixed with the excrements of thoſe birds; and therefore the old proverb was not untrue, *Turdus ſibi malum cacat*, even in the literall ſenſe; and ſo where this Viſcum is meerly an excreſcence, it may grow downwards under boughes, where no ſeeds can come or remain. 6. *He can deny that a Snake will not endure the ſhade of an Aſh*; *Pliny* and other ancients affirm it, perhaps upon ſurer grounds then the Doctor denies it; for though here in theſe cold Countries our Snakes may accord with our Aſhes, yet it may be otherwiſe in hot Regions, where the Serpents are more venemous, and the Aſh-leaves more powerfull: why may there not be ſomewhat in the ſhade of an Aſh repugnant to the Serpent, whereas the leaves and juice thereof are ſuch Antidotes againſt poyſon, as *Dioſcorides* and *Mathiolus* ſhew? *Cardan* tels us, That in *Sardinia* the ſhadow of the *Rodo-daphne* is pernitious to thoſe that ſleep under it, making them mad. He inſtanceth the dangerous qualities proceeding from the ſhadowes of ſome other trees; and *Lucretius* affirms, That the ſhade of ſome other trees procure pains in the head, and other dangerous effects.

Arboribus primum certus gravis umbra tributa eſt
Uſque adeo capitis faciant ut ſæpe dolores,
Si quis eas ſubter jacuit proſtratus in herbis.

CHAP.

CHAP. XX.

What the Ancients have written of Griffins may be true. Griffins mentioned in Scripture. Grypi and Gryphes, Perez and Oſſifrage, what?

THe Doctor [denies there be Griffins, that is, dubious animals in the fore part reſembling an Eagle, and behind a Lion, with erected ears, foure feet, and a long tail, being averred by *Ælian*, *Solinus*, *Mela*, and *Herodotus*,] *Anſw.* *Ælian* tells us, That Griffins are like Lions in their pawes and feet, and like Eagles in their wings and head. *Solinus* ſaith onely, that they are very fierce fowls; *Mela*, that they are cruell and ſtubborn animals; *Herodotus* onely mentions their names, when hee ſhewes, the *Arimaſpi* takes away their gold from them: So *Philoſtrates* ſhewes, That in ſtrength and bigneſſe they are like Lions; So *Pauſanius* ſpeaks of them; but neither he, nor the others named, tell us in plain terms, that they are like Lions behind, and Eagles in the fore-part: For *Pliny* and ſome others doubt of this as fabulous. 2. Suppoſe they had thus deſcribed Griffins, as mixt and dubious animals, yet this is not ſufficient to prove them fabulous: for divers ſuch animals there are in the World. *Acoſta* tells us of the Indian *Pacos*, which in ſome parts thereof reſemble the Aſſe, in others the Sheep. *Lerius* ſpeakes of the *Tapirouſſou* in *Braſil*, which reſembles both an Aſſe and an Heifer. Many other ſorts of mixt animals we read of, as flying Cats, and flying Fiſhes; and ſome kind of Apes with Dogges heads, therefore called *Cynocephali*. Our Bats are partly birds and partly beaſts: They flye like a bird with two feet, they walk like a beaſt with four: They flye with their feet and walk with their wings, ſaith *Scaliger*. And which is a greater wonder, there are Plant-animals, or Zoophits, partly plants, and partly animals. But he ſaith, *In Bats and ſuch mixed animals, there is a commixtion of both in the whole, rather then an adaptation of the one into the other.* Here he is deceived; for in Bats and ſuch like Animals, it is eaſily ſeen what parts are of the bird, what of the beaſt, which we could not diſcern if there were a commixtion: it is rather an adaptation then. This is moſt apparant in that Indian beaſt which hath the forepart of a Fox, the hinder part of an Ape, the eares of an Owl, and a bag or purſe under its belly, wherein its young ones hide themſelves in time of danger. Neither is it fabulous that theſe Griffins are greedy of gold,

which they preſerve & hide in the earth: for I have ſeen Mag-pies doe the like: I have obſerved one which ſtole money, and hid it in a hole; and perhaps it may be from this that *Plautus* calls Griffins Mag-pies; *Picos divitiis qui colunt aureos montes ſupero. In Aulul.* And yet I am of *Ælians* opinion, That it is not ſo much for the gold they fight, as for their young ones, which men uſe to carry away when they ſearch the Countrey for gold. Neither was *Ariſtæus* the firſt that affirmed theſe Griffins, as the Doctor ſaith; for we read of them in *Leviticus* and *Deuteronomy*, which though *Tremellius* and wee uſe not, but the word *Oſſifrage*, yet the Hebrew word *Peres* is tranſlated Griffi by the Septuagints, by the old Latin, by *Jerom* and *Pagnin*, by *Arias Montanus*, and by the *Italian* verſion: And if פֶּרֶס be from פָּרַס to break, then may the word Oſſifrage be meant of the Griffin: for no bird ſo fit to break bones, as this fierce and ſtrong animall. Γρυψ then ſignifieth properly a Griffin, and not a kind of Eagle with a hooked Bill; for both birds with hooked Bills, and men with Aquilan noſes, are called *Gryphi*, not *Gryphes*. Hence then it appeares, that the negative teſtimony of *Michovius* is not ſufficient to overthrow the received opinion of the Ancients concerning Griffins, eſpecially ſeeing there is a poſſibility in nature for ſuch a compounded animall. For the *Gyraffa*, or *Camelopardalis*, is of a ſtranger compoſition, being made of the Libbard, Buffe, Hart, and Camell. Beſides, though ſome fabulous narrations may be added to the ſtory of the Griffins, as of the one-ey'd *Arimaſpi* with whom they fight, yet it follows not that therefore there are no Griffins. If any man ſay, That now ſuch animals are not to be ſeen; I anſwer, It may be ſo, and yet not periſhed: for they may be removed to places of more remoteneſſe and ſecurity, and inacceſſible to men: for many ſuch places there are in the great and vaſt Countries of *Scythia*, and *Tartaria*, or *Cathaia*, whither our *Europeans* durſt never, nor could venture.

CHAP.

CHAP. XXI.

1. *The exiſtence of the Phœnix proved by divers reaſons: and the contrary objections refelled: the ſtrange generation of ſome birds.* 2. *The Ancients cleared concerning the Phœnix, and whether the Phœnix be mentioned in Scripture. Divers ſorts of generation in divers creatures. The Concluſion, with an Admonition not to ſleight the Ancients opinion and Doctrine.*

BEcauſe the Doctor following the opinion of *Pererius*, *Fernandus de Cordova*, *Francius*, and ſome others, abſolutely denies the exiſtence of the *Phœnix*, I will in ſome few poſitions ſet down my opinion concerning this bird. 1. I grant that ſome paſſages concerning this bird are fabulous, ; as that he is ſeen but once in 500 years, that there is but one onely in the World; or if there be two, that the old Phœnix is buried by the younger at *Heliopolis*. 2. Theſe fabulous narrations doe not prove there is no ſuch bird, no more then the fables that are written of Saint *Francis*, prove that there was never any ſuch man. 3. Nor doth it follow, that there is no ſuch bird, becauſe ſome write, they never read of any who had ſeen a Phœnix; for though theſe few vvho vvrite of this bird, did never ſee him in a picture, yet the Ægyptians, from whom they had the knowledge of the Phœnix, did ſee him. *Tacitus* writes, That no man doubts but that this bird is ſometime ſeen in Ægypt, *Aſpici aliquando in Ægypto hanc volucrem non ambiguitur*, *Ann. l. 6.* There are ſome creatures in *Africa* and the *Indies*, that were never ſeen by any of thoſe who writ their hiſtories, the knowledge whereof they have onely by relation from the inhabitants. 4. Though Ægypt vvas the mother of many fictions, as *Pererius* ſheweth, yet it vvill not follow that the Phœnix is a fiction, or that Ægypt vvas not alſo the School of many truths; for the Græcians from thence had the their knowledge and vviſdom, *Orpheus*, *Homer*, *Muſæus*, the Poets; *Lycurgus*, and *Solon*, their Law-givers; *Plato* & *Pythagoras*, their Philoſophers; *Eudoxus* and other Mathematicians, were all Scholars in Ægypt. 5. That there is but one Phœnix, is not againſt Philoſophy and Logick, which teacheth us, That the ſpecies can be preſerved in one individuall, *Pererius* ſheweth, That this is only true in things incorruptible, as in the Sun and Moon; but I ſay, That this is true alſo in things ſubject to corruption; for in theſe, though the individuals be corruptible, yet the ſpecies are eternal;

ternall; and it skils not how few the particulars be, ſo long as the ſpecies can be preſerved in one; and though there be no individuall actually exiſtent, yet the ſpecies can be preſerved; for in Winter the ſpecies of Roſes is not periſhed, though there be no individuall Roſes actually exiſtent; for even then they have their being and eſſence, though their exiſtence be but potentially in the aſhes, as the forms of the elements are in the mixed bodies, or as the form of a cock is in the egg, which by the heat of the hen or Sun, is actually educed. 6. Whereas *Pererius* holdeth it inconvenient, that ſo noble a ſpecies as the Phœnix is, ſhould have but one individual, ſubject to ſo many dangers; I anſwer, That in all beaſts and birds, the nobler the ſpecies is, the fewer are the individuals; there are not ſo many Eagles as Doves, nor Elephants as Rabbets, and Nature is ſo provident in the conſervation of the ſpecies, that where there be few of the kind, they live long, and have their abode in ſome remote rocks, mountains, Iſlands and Deſarts, from the dangers they are ſubject to by men, as Eagles, and the Phœnix, which is ſeen but ſeldom. Now multitude of individuals doth not argue the nobility of the ſpecies, but rather imperfection; for it proceeds from the diviſion of the matter, whereas unity noteth perfection, as iſſuing from the act and form of things. 7. Whereas *Fernander* ſheweth, it's a miracle that the Phœnix can never be taken dead or alive; I anſwer, It is a miracle in nature, and we know there be many naturall ſecrets and miracles: is it not a miracle that the *Manucodiata*, or bird of Paradiſe, is found dead ſometimes, but was never ſeen alive, neither was there ever any meat or excrement found in his belly? how he ſhould be fed, where his abode is, from whence he cometh (for his body is found ſomtime on the ſea, ſomtime on the land) no man knows: the Phœnix is ſomtime ſeen alive, but ſeldome, becauſe provident Nature hath given him that inſtinct for the preſervation of his kind, that he appears to man, the great tyrant over the creatures, but ſeldome; for had *Heliogabalus*, that Roman Glutton, met with him, hee had devoured him, though there were no more in the world. Nature hath given to each creature ſo much policie, as to preſerve themſelves from danger; and the fewer there be of that kind, the more wary and cautelous they are; and if it be true that *Pliny* and others write of the Ravens, that their neſts can never be found, it is a great miracle, which perhaps may be ſo in *Italy*; yet in the rocks of *Norway*, *Shetland*, and other Northern places, their Neſts are found. But it is more to bee admired,

admired, that Ravens use to flye to the places where dead bodies are, and by a strange instinct have knowledge of the bodies dying two dayes before they be dead; and I think there is as great a miracle in the Loadstone, as there is in the Phœnix. 8. It is as possible for a Phœnix to arise out of the ashes of the dead parent, as for a silk-worm to proceed out of the Egge of the dead Worm. If any reply, That the one is perfect, the other imperfect; I answer, That every thing is perfect in its own kind, and in generation; Nature looks not at the perfection or imperfection of the creature, but to the aptitude and disposition of the matter to receive such a form, Again, a Cock, which is a perfect creature, is excluded out of the Egge by the heat of the Sun, or Fire; and *Scaliger* speaks of a bird that was found in a shell, the learned men of that time concluded, That the Oyster was turned into a bird. I take it to be as great a wonder for a Mule, which is a perfecter creature then a bird, to be generated of the seed of another kind, then that the Phœnix should arise out of the putrified ashes; That the Clakgeese are generated of trees in the North-seas, beyond *Scotland*, is not altogether fabulous; the inhabitants thereabout at this day constantly believe it. They are observed every year to flye from the North to *Shetland* and *Orkney*, where I have been; in the beginning of Winter they come thither, in the Spring they flye away Northward in flocks, which must be to *Norway* or *Greenland*, for I know no other land they can repair to Northward. *Island* is Northwest, but neither in these places, nor any where else, could their nests be ever yet found. Besides, bodies of old trees that have been driven upon these Islands by the winds, have had upon them the full proportion and shape of those birds. And why should this be more incredible then that which *Scaliger* writes of a certain tree in the river *Juverna*, whose leaves falling into the water, receive the form & shape of fishes, and life withall; and of that tree in the Isle *Cimbulon*, whose leaves falling on the ground, move themselves backward & forward; being touched, they go back: one of these was kept 8 dayes alive in a platter. 9. Whereas *Fernandus* asketh, whether every parcell of the dead Phœnix his ashes hath an aptitude to become a new Phœnix; if it hath, then (saith hee) there is more then one Phœnix; if it have not, what is the reason that one part of these ashes should have this aptitude, and not the other; I answer, All that heap of ashes is but one body, of which is produced one Phœnix, as one bird out

of

of one egge, and not many out of the ſeverall parts thereof. 10. Though *Ariſtotle* and ſome others make no mention of the Phœnix, it will not follow that therefore there is no ſuch bird extant; for there are many kinds of creatures of which they write not. 11. It is likely that the bird *Semenda* in the *Indies*, vvhich burneth her ſelf to aſhes, out of which ſprings another bird of the ſame kind, is the very ſame with the old Phœnix. 12. The teſtimony of ſo many Writers, eſpecially of the Fathers, proving by the Phœnix the Incarnation of Chriſt, and his Reſurrection, and withall our reſuſcitation in the laſt day, doe induce me to believe there is ſuch a bird, elſe their Arguments had been of ſmall validity among the Gentiles, if they had not believed there was ſuch as bird. What wonder is it, ſaith *Tertullian*, for a virgin to conceive, when the Eaſtern bird is generated without copulation, *Peribunt homines, avibus Arabiæ de reſurrectione ſua ſecuris.* Shall men utterly periſh (ſaith he) and the birds of *Arabia* be ſure of their reſurrection? The exiſtence of this bird is aſſerted by *Herodotus*, *Seneca*, *Mela*, *Tacitus*, *Pliny*, *Solinus*, *Ælian*, *Lampridius*, *Aur. Victor*, *Laertius*, *Suidas*, and others of the Gentile-Writers. The Chriſtian Doctors who affirm the ſame, are, *Clemens*, *Romanus*, *Tertullian*, *Euſebius*, *Cyril* of Jeruſalem, *Epiphanius*, *Nazianzenus*, *Ambroſe*, *Auguſtine*, *Hierom*, *Lactantius*, and many others.

Now out of what we have ſpoken, we can eaſily anſwer the Doctors objections whic he hath collected out of *Pererius*, *Feriundes*, *Franzius*, and others, as firſt, when he ſaith, That *none of thoſe who have written of the* Phœnix, *are oculary deſcribers thereof.* Anſ. Neither vvas *Ariſtotle*, *Geſner*, *Aldrovandus*, and others, vvho have vvritten largely of beaſts, birds, and Fiſhes ocular vvitneſſes of all they vvrote: they are forced to deliver much upon hear-ſay and tradition: So thoſe that vvrite the later ſtories of American and Indian animals, never ſaw all they vvrite of. Secondly when he ſaith, [That *Herodotus*, *Tacitus*, and *Pliny*, ſpeak ſo dubiouſly, that they overthrow the whole relation of the *Phœnix.*] *Anſw. Herodotus* doubteth not of the exiſtency of the Phœnix, but onely of ſome circumſtances delivered by the Heliopolitans, to wit, that the younger Phœnix ſhould carry his Father wrapt up in Myrrh, to the Temple of the Sun, and there bury him; ſo *Tacitus* denieth not the true Phœnix, but onely ſaith, That ſome hold the Phœnix there deſcribed, which was ſeen in the dayes of *Ptolomy* in Ægypt, not the right Phœnix ſpoken of by the Ancients. The words of *Pliny* are falſified by the Doctor, who cites them thus:

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Sed quæ falſa eſſe nemò dubitabit: whereas the words are, *Sed quem falſum eſſe nemo dubitabit*: So that he doth not ſay, That what is written of the Phœnix is falſe; but onely that this Phœnix which was brought to *Rome* in the Conſulſhip of *Claudius*, was falſe, and not the right one. 3. He ſaith, *That they who diſcourſe of the Phœnix, deliver themſelves diverſly, contrarily, or contradictorily. Anſw.* There is no contradiction except it be (*ad idem*) moſt of them agree in the ſubſtance, that there is a Phœnix, they onely differ in the accidents and circumſtances of age, colour, ann place. We muſt not deny all ſimply that is controverted by Writers: for ſo we might deny moſt points both in Divinity and Philoſophy. 4. He ſaith the word Phœnix in *Job* 29. 48. *can have no animall ſignification, becauſe there is expreſſed* φοίνικος, the trunk of the Palm-tree; and the Hebrew word is by *Tremellius* rendred *Sand. Anſw.* The ſame which properly ſignifieth the trunk of the Palm, may metaphorically be meant of the body of the Phœnix. For the ſame word in Greek is given both to the Palm and Phœnix; for as the one is long green, ſo the other is long-lived: but the Hebrew word חול *hhol* in that place, though expounded *Sand* by *Tremellius*. yet ſignifieth a Phœnix, as both *Pagnin*, *Montanus*, *Buxtorfius*, and other Hebricians affirm; and ſo doth *R. Salomon* with other ancient Hebrewes expound this Text of the Phœnix, conſonant to which is the Tygurin Verſion, ſo *Tertullian*; *Philippus Presbyter*, and *Cajetan* expound this place of the Phœnix, being the ſymbole of our reſurrection, & of a long life. And it ſeems that the word Phœnix is more conſonant to the Text then *Sand*, becauſe *Job* ſpeaks of his neſt: *I ſhall die in my neſt* (ſaith he) *and ſhall multiply my dayes as the* Phœnix. 5. He ſaith, [That the exiſtence of the Phœnix is repugnant to the Scripture, which affirms, there went of every ſort two at the leaſt into the Ark. It infringeth alſo the benediction of multiplication, *Gen.* 1. For they cannot be ſaid to multiply who do not tranſcend an unity.] *Anſw.* When the Scripture ſpeakes of two that entred into the Ark of every ſort, it means of thoſe that were diſtinguiſhed into male and female. for the end why theſe went in by couples, was for procreation, now the Phœnix hath no diſtinction of Sex, and therefore continueth not his ſpecies by copulation, as other creatures do. Hence though he enters into the Ark, it was not needfull he ſhould be named among thoſe that went in by couples and ſevens. For how could hee that was but one, be ſaid to goe in two and two, or male and female. As for the benediction of multiplication,

cation, it was not pronounced or enjoyned to the Phœnix, which was not capable of it, God having ſupplied the want of that with another benediction equivalent, which was a longer life then other animals, and a peculiar way to continue the ſpecies without multiplication of the *Individuum*. 6. He ſaith, *That to animal generation is required the concurrente of two Sexes, and therefore ſuch as have no diſtinction of Sex, engender not at all, as Ariſtotle conceives of Eeles, and teſtatious animals. Anſ. Ariſtotle de gen. animal. l. 3. c. 10.* ſhewes that there no diſtinction of ſex in divers Fiſhes, and Bees, which notwithſtanding generate. But when he ſpeaks of Eels in *hiſtoria animal*, he ſhews they do not generate at all, not becauſe they want diſtinction of ſex, as the Doctor ſaith; for he ſpeaks of divers creatures that generate without that diſtinction; but becauſe there is not in them ὠοτοκία, a production or generation of egges or ſpawn; for all thoſe kind of Fiſhes, ſaith he, which generate, have ſpawn or egges in them, which Eels want. Again, he ſhews in his firſt book *de gener. animal. c. 1.* That ſanguine creatures are diſtinguiſhed into male and female, except a few, ſaith he: If then there be ſome ſangniue animals without ſex, what wonder is it if the Phœnix have none? As for teſtacious animals, they want diſtinction of ſex, becauſe they are, as he ſaith, *Immoveable alone*, and ſtick to rocks, having as it were the life of plants, and therefore are no other wiſe diſtinguiſhed into male and female then plants are, which is not properly but analogically. 7. He argueth, *That if the worm into which the Phœnix is corrupted, becommeth a Phœnix, this would confound the generation of perfect and imperfect animals, and the lawes of Nature.* Again, *the generation of venerous animals is not from a corruption of themſelves, but rather a ſeminal and ſpecifical diffuſion. Anſw.* The generation of the Phœnix is no confuſion or diſturbance of Natures laws, which delights in variety of productins. Therefore in plants we ſee ſome produced by their ſeed, ſome by their roots without ſeed; ſome by their ſtems onely without root or ſeeds; ſome without any of theſe, immediatly of the earth: So in animals ſome are generated by coition of male and female in the ſame kind, as Men, Lions, Horſes, &c. Some by coition of different kinds, as Mules; ſome without coition, by affriction onely, as divers Fiſhes; ſome are produced by the female without the male, as the fiſh *Erythinus*, which ſome think to be the Rochet; ſome by reception of the females organ within the male, as flies; ſome by a ſalivious froth, as the ſhell fiſhes called the Purple; ſome are progenerated of ſlime without coition, outwardly

wardly in the mud, as Eels; ſome without coition, but within the body of the parents, as Bees: And laſtly, the Phœnix is begot without coition, of its own putrified body, at which the Doctor wonders how it ſhould be, [ſeeing the generation of Inſects is not by corruption of themſelves, but rather a ſeminall effuſion.] To which I anſwer with *Ariſtotle*, ſpeaking of *Bees*, that as they have a proper and peculiar kind of Nature differing from all other creatures, ſo it was fit they ſhould have γενεσιν ἰδιον, a peculiar and proper kind of production. The like I may of the Phœnix, which is a miracle in nature, both in his his longevity, numericall unity, and way of generation. And in this wonderfull variety the Creator manifeſts his wiſdome, power and glory.

Thus have I briefly an curſorily run over the Doctors elaborate book, *tanquam canis ad Nilum*, having ſtoln ſome hours from my univerſall Hiſtory, partly to ſatisfie my ſelf and deſires of my friends, and partly to vindicate the ancient Sages from wrong and miſconſtruction, thing it a part of my duty to honor and defend their reputation, whence originally I have my knowledge, and not with too many in this looſe and vvanton age, ſlight all ancient Doctrines and Principles, hunting after new conceits and whimzies, vvhich though ſpecious to the eye at the firſt view, yet upon neer inſpection and touch, diſſolve like the apples of *Sodom* into duſt. I pitie to ſee ſo many young heads ſtill gaping like Camelions for knowledge, and are never filled, becauſe they feed upon airy and empty phanſies, loathing the ſound, ſolid and vvholſome viands of Peripatetick wiſdome, they reject *Ariſtotles* pure fountains, and digge to themſelves ciſternes that will hold no water; whereas they ſhonld ſtick cloſe and adhere as it were by a matrimoniall conjunction to ſound doctrine, they go a whoring as the Scripture ſpeaketh) after their own inventions. Let us not wander then any longer with *Hagar* in the wild deſart vvhere there is no vvater; for the little which is in our pitcher, wil be quickly ſpent; but let us return to our Maſters houſe, there we ſhal find pure fountains of ancient Univerſity learning. Let Prodigals forſake their husks, and leave them to ſwine, they will find bread enough at home: And as dutifull children let us cover the nakedneſſe of our Fathers with the Cloke of a favourable Interpretation.

FINIS

AN APPENDIX TO *Arcana Microcosmi*:

WHEREIN
Are contained divers Passages;

As of
- Fishes,
- Presages,
- Sneezing,
- Thunder-struck persons, &c.

WITH
A Refutation of divers Tenets held by Doctor HARVIE in his Book
De Generatione.
The LORD BACON in his
Naturall History,
And some others.

By AEEXANDER ROSS.

LONDON,
Printed by *Thomas Newcomb.* 1652.

To the Worſhipfull and my much honored Friend,

Andrew Henley, Eſq;

SIR,

I *Should wrong both you, and my ſelf, if with* Harpocrates, *the God of Silence, I ſhould lay my finger on my lip, and tacitly paſſe over either your Worth and Goodneſſe, or my obligations and thankfulneſſe: Perhaps I may treſpaſſe on your modeſty, which deſires no* Trumpet *to ſound before you, yet doubtleſſe I ſhall do you right otherwiſe, if I acquaint the world with your vertues, and that you are one of that ſmall number which in this ſordid and phantaſticall Age loves true and ſolid* Learning, *not being carried away with the vain whimzies of brainſick Scioliſts, whoſe learning and piety conſiſts in ſhaking the*

foundation of both, eſteeming that building ſtrongeſt which is erected on ſtubble and ſtraw: but let them alone with their brittle and ſandy ground-work, Old Truth is that ſure Rock againſt which Hell gates ſhall not prevail. I have adventured to conſecrate this ſmall piece to you, as one who is truly acquainted and affected with the Old and True principles. In this Dedication *I have endeavoured to diſcharge my ſelfe of ingratitude and oblivion, and to teſtifie to the world how much I am indebted to you, which I will alwayes thankfully acknowledge ſo long as I am*

Sir,

Your humble ſervant
to command,

ALEXANDER ROSS.

AN

AN APPENDIX.

Containing divers paſſages of Fiſhes, Preſages, Sneezing, Thunder, &c.

With a Refutation of Doctor HARVY, the Lord BACON, and others.

CHAP. I.

1. *Fiſhes breath not: the Reaſons thereof, and the contrary objections anſwered.* 2. *Foſſil or earth-fiſhes.* 3. *Fiſhes delight in the light.* 4. *Fiſhes of Humane ſhapes.* 5. *Fiſhes are cunning and docible creatures.* 6. *Why ſome Fiſhes have Feet and Wings.* 7. *Many monſtrous fiſhes.*

I.

THat Fiſhes have no breathing, or reſpiration, is manifeſt, 1. Becauſe they want Lungs, and other Inſtruments of breathing: For, though they may receive aire in at the mouth, and let it out again by their gills; yet this is not reſpiration, which is the action of the Lungs, Wind-pipe, and Diaphragma in attracting the air for refrigeration, and emitting the ſame. 2. There is no air under or in the water, therefore fiſhes cannot breath there. For this cauſe terreſtriall creatures die in the waters for want of air, as fiſhes die in the air for want of water. If any will ſay, That man dieth in the water, not for want of aire there, but for want of gills, or ſome other paſſage to let out the water received into the lungs; I anſwer, The Dolphin hath a paſſage, or Fiſtula,

Fiſtula to let out the water; and yet there he could not live without ſuffocation, if he did not now and then elevate his head above the water to draw breath. If it be be again objected, That water is a body mixt with air, therefore Fiſhes doe breath; I anſwer, That ſo is wine which we drink, mixed with more air then water is; yet if we did not draw the air above, we ſhould be quickly choked. The quantity of air in the water is ſo little, that it is diſcernable by Art onely, not by the ſenſes: and ſo there is ſome water in that air which we breath; yet we are not ſaid to breath water, but air. Again, if there were air in the water which the fiſhes drew, bubbles would appear upon the ſuperficies thereof, as we ſee in Mice, or other terreſtriall creatures drowned in the water: For as ſoon as the water fils the breaſt and lungs, it draws out the air, which tending upward towards the ſuperficies, cauſeth bubbles. If it be objected, That fiſhes breath, and yet make no bubbling, becauſe the air hath a free paſſage through the gills; I anſwer, That the freeneſſe of paſſage is no hinderance to bubbling, ſeeing any light agitation of the water will make bubbles, when it hath received air within it, and ſo we deny not but fiſhes may make the water bubble, not by their breathing, but by their motion. 3. If fiſhes breath air in the water, why doe they die when they are in the air? If any ſay, It is becauſe they cannot endure the coldneſſe of the air; I anſwer, That the water is colder then the air. Again, we ſee, that the hotter the air is, the fiſhes die the ſooner. Hence it is obſerved, that Eels live longer in a Northern then in a Southern wind, and theſe live longer out of the water then other fiſhes, becauſe their heat is in a more viſcid and ſlimy humidity then others. Hence it is, that the parts cut off doe live and move ſometime, becauſe their heat is not eaſily diſſipated in ſo ſlimy a matter. But ſome will object, That fiſhes out of the water gape for air, therefore they breath. *Anſw.* To gape, or open the mouth, is no argument of breathing, except we will give reſpiration to Oyſters which ſometimes gape. Again, fiſhes gape not for air, but for water: ſo men in the water being almoſt ſtilled, gape, not for water, but for air. *Object.* 2. The air penetrateth into the thick earth, therefore much more into the thin water. *Anſw.* I deny that air can penetrate into the thick parts of the earth; for that were to make penetration of dimenſions, but onely to avoid vacuity the air enters into, and fills up the holes and cavernoſities of the earth: for if the air could pierce the thick earth, there would never be earthquakes;

quakes; and if that air which is mixt with the ſubſtances of the earth, were ſufficient for reſpiration, Moles needed not take ſo much pains as to work through and make cavities purpoſely for reſpiration. For ſhut up a Mole within a parcell of earth which he cannot dig through, he will die for want of ſufficient air. *Object.* 3. Exhalations and vapours ariſe out of the water, which ſhews there is air. *Anſw.* Theſe exhalations are the thinner parts of the water turned into vapours by heat or motion; whence it will not follow, that air is in the water actually, or a body ſeparated from the water, in which are not cavities, as in the earth, and much leſſe will it follow, that fiſhes breath in the water, though there were air in it, ſeeing they want the organs of breathing, as is ſaid. *Object.* 4. Fiſhes incloſed in a veſſel halfe full of water, ſtrive to get up into the air. *Anſw.* This ſtriving to get uppermoſt, is not to enjoy the air, which is not their element, but to get out of priſon, and to have more ſcope, being ſtraitned in a narrow veſſel: ſo fiſhes in the net ſtruggle to get out, and to be at liberty. *Object.* 5. Fiſh in a cloſe veſſell die for want of air. *Anſw.* They die for want of ſweet water, which being included from freſh air, degenerates and putrifies. Hence fiſh die in a pond that is long frozen; becauſe the water for want of agitation and freſh air, becomes unwholſome to the fiſhes, which yet can live a moneth together under the Ice, without any air. *Scaliger* ſhewes that he hath kept fiſh in a cloſe veſſel, who have lived, and the ſame in an open veſſell who have died. It is alſo manifeſt, that Leaches in a cloſe glaſſe will live whole years without air. *Object.* 6. *Pliny* objects againſt *Ariſtotle*, that as ſome creatures have not blood, but an humor; ſo ſome fiſhes want lungs, but have ſome other inſtrument by which they breath. *Anſw.* It is as eaſie for us to deny, as for him to affirm that which he could never prove: For neither doth he ſhew what theſe fiſhes be, nor what are theſe inſtruments, nor (though there were ſuch) can he prove that they breath by them. And though ſome creatures have an humor in ſtead of blood, yet that humor hath not the properties, qualities, nor office of the blood. *Object.* 7. Fiſhes gape, therefore they breath. *Anſw.* Here is no ſequell; for Oyſters gape, which breath not, and many creatures breath which gape not. Again, if with their gaping there were any breathing, we ſhould ſee (ſaith *Ariſtotle*) the breathing parts move: but there is no motion at all, and it is impoſſible there ſhould be attraction and emiſſion of the air without motion. Beſides, if Fiſhes breathed, we ſhould ſee

ſome

ſome bubbles on the water when their breath went out, as in breathing animals when they die in the water. It is true that lunged fiſhes, ſuch as Dolphins, Whales, Seals, and Frogges, make bubbles, becauſe they breath, which will not prove that all fiſhes do ſo. And yet there be other cauſes of bubbling beſides expiration: for rains, tempeſts, vapours, or any agitation of the water will cauſe bubbling. *Object.* 8. The Moon gives increment to ſhell-fiſhes, therefore their ſpirits alſo do increaſe. *Anſw.* It's true, if they ſpeak of the animall and vitall ſpirits; but what is this to breathing, the ſubject whereof is the air, and not thoſe innate ſpirits: and if increment of ſubſtance doth ſuppoſe reſpiration, then trees muſt breath as they grow in bigneſſe. And although the Moon cauſeth humid bodies to ſwell, yet ſhe doth not make the air by which we breath, being a part of the Univerſe. *Object.* 9. Fiſhes doe ſmell and hear, therefore they breath, becauſe air is the matter of all three. *Anſw.* Air indeed may be called the matter of breathing, but not of hearing and ſmelling; it is not the air we ſmell or hear, but we ſmell the odors, and hear the ſounds in the air, which is therefore properly called by Philoſophers, the *Medium*, not the *matter* of hearing and ſmelling. And as the air is to us, ſo the water is to fiſhes the *medium* of hearing and ſmelling: And if it be the matter of breathing to fiſhes, then it is not air but water which they breath; whereas indeed water cannot be the ſubject or matter of breathing, nor can they breath at all which want the organs of breath. *Object.* 10. No animall can live without reſpiration, therefore fiſhes breath. *Anſw.* The antecedent is denied; for many animals live without reſpiration, onely by tranſpiration, ſuch are inſects, ſo doth the child in the matrix, ſo do women in their hiſtericall paſſions, theſe breath not, yet they live. *Object.* 11. *Pliny* tells us that fiſhes do ſleep, therefore they breath. *Anſw.* Breathing hath no relation to ſleep, it is neither the effect, nor cauſe, nor quality, nor part, nor property, nor conſequent of ſleep: for ſome animals ſleep, which breath not all that time, as Dormice in Winter, the child in the mothers womb breathes not, as having in the matrix or membran within which he lieth, no air at all, but a watriſh humor, which if he ſhould ſuck in by the lungs, he would be preſently ſuffocated; yet at that time the chid ſleepeth. There is no community at all in the ſubject or organ of ſleep and reſpiration, nor in their natures, the one being a reſt or ceſſation, the other a motion; the one conſiſting in the ſenſes within the head, the other in the lungs, breaſt,

and

and Diaphragma. Again, reſpiration conſiſts rather in the actions of life and ſenſe, which accompany waking, then in ſleep, which reſembles death. Reſpiration is for refrigeration of the heart, which is more heated by the motions of the body whilſt we are awake, then by reſt when we are aſleep; therefore men that walk, labour, run, ſtruggle, or whoſe heart is heated by anger, or Feavers, breath much faſter then in ſleep, as ſtanding more in need of air for refrigeration. So children becauſe of their heat breath faſter then old men. Therefore we conclude with *Ariſtotle*, that fiſhes which want lungs & throars, & have gills, breath not; for what needed lungs to draw in air, ſeeing Nature hath given them gills to let in water for cooling the fiſhes heat, wch is but weak, becauſe they have little blood.

II. That ſome ſmall fiſhes have been found on hills farre from the Sea, is verified by divers; as alſo that ſometimes fiſhes are digged out of the earth, which we may call *Foſſil*, to diſtinguiſh them from aquatile, is recorded by grave and ancient Writers: But I believe that theſe are not true fiſhes, but rather terreſtriall creatures reſembling fiſhes in their outward ſhape; for as many fiſhes reſemble terreſtriall animals, which are not therefore properly terreſtriall, ſo many terreſtriall creatures may reſemble fiſhes, which properly are not ſuch; or elſe where theſe Foſſil fiſhes are found, there are ſubterraneall waters not farre off, by which they are conveyed thither. Hence ſometimes fiſhes have been found in deep wells; and I have read of ſome fiſhes found in ſprings of ſulphury aud allum water: for otherwiſe fiſhes can no more live in the earth, then earthy creatures in the water, ſeeing nothing can live out of its own element, where it hath its originall food and conſervation. Or laſtly, theſe land fiſhes have been ſuch as have fallen out of the clouds: For I have read in good Authors of divers ſhowers or rains of fiſhes, and of Frogs and Mice, and ſuch like animals, out of the clouds.

III. That Fiſhes in Moon-ſhine nights, chiefly when ſhe is in the full, delight to play upon the ſuperficies of the water, is plain by fiſhermen, who take greateſt quantities of them then. The cauſe of this may be the delight that fiſhes take in the light, or elſe they finde ſome moderate heat in the ſuperficies of the water when the Moon is full: but I rather think it is the pleaſure they take in the Moon light, which gives a ſilver brightneſſe to the water, and Nature hath given them a quick ſight and eminent eyes, whereas the ſenſes of ſmelling and hearing are in them, yet the organs are ſo obſcure they cannot

not be found; and albeit they have all the senses, yet they are dumb, for they make no sound at all, because they breath not, nor have they the organs of sounding, such as the throat, windpipe and lungs.

IV. That some fishes resemble men in their faces, hands, and other parts, is no fable, for such are not only recorded by the ancients, but also have been seen by late Navigators, *Lerius* saw none of them, yet relates that an *American* fisherman cut off the hand from one of those fishes which did offer to get into his boat, the hand had five distinct fingers like ours, and in his face he resembled a man. *Scaliger* writes that one of those sea-men, or men-fishes was seen by *Hierom* Lord of *Noricum*, which laid hold on the cable of his ship, this story he related as a truth to *Maximilian* the Emperor. These fishes were called anciently *Tritons*, *Nereides*, and *Sirenes*, one of those *Scaliger* saw at *Parma*, about the bigness of a childe of two years old. In some part of *Scythia Pliny* shewes that men did feed upon these fishes, which some condemned for Canibals, but injurionsly; for it is not the outward shape, but the soul which makes the man; neither doth the soul or essence of man admit degrees, which it must needs do, if those *Tritons* were imperfect men; neither is it unlikely what is written of the River *Colhan* in the Kingdom of *Cohin* among the *Indians*. That there are some human shaped fishes there called *Cippæ*, which feed upon other fishes, these hide themselves in the water by day, but in the night time they come out upon the banks, and by striking one flint against another, make such a light, that the fishes in the water being delighted with the sparkles, flock to the bank, so that the *Cippæ* fall upon them and devour them. This I say is not improbable, if we observe how many cunning ways nature hath given to the fox, and other creatures to attain their prey. *Scaliger* wonders why these *Cippæ* do not rather catch their prey in the water, then to take so much pains on the bank; but the reason may be, that either these *Cippæ* are not so nimble and swift as those other fishes, or else that these fishes will not come near them, being afraid of their human shape, which is formidable to all creatures.

V. That Fishes are not dull and stupid creatures, as *Cardan* and some others do think, is manifest by their sagacitie and cunning they have, both to finde out their prey, and to defend themselves from their enemies. The fish called Uranioscopus, deceives the other fishes by a membran which he thrusts out of his

his mouth like a worm, which they ſuppoſing to be ſo, lay hold on it, and ſo are catch'd. Herrings being conſcious of their own infirmitie, never ſwim alone, but in great ſhoals, and the whales who prey upon the herrings, by a natural inſtinct frequent thoſe ſeas moſt, where there be moſt herrings; and I have obſerved in the Northern ſeas for a mile or two in compaſſe the ſea covered with herrings flying from their enemies, the whales which were in purſuit of them, tumbling like hills on the ſea; but by reaſon of their huge bodies and ſlow motion, could not overtake them; and when the herrings are in any danger, they draw as near to the ſhore as they can, that the whales purſuing them, may run themſelves on the ſand, where they ſtick, as often times they do, and ſo become a prey themſelvs to man: thus in one year 80 whales run on the Iſlands of *Orkney*, where I have been a whole year together; ſo that the Biſhop of thoſe Iſlands had 8 whales for his Tithe that year. There are alſo in the Northern ſeas, fiſhes about the bigneſs of an oxe, having ſhort legs like a beaver, and two great teeth ſticking out, of which they make handles for knives; theſe fiſhes are called Morſſe, they ſleep either on the ice, or upon ſome high and ſteep place on the ſhore, when they ſleep they have their Centinel to watch, who in danger, by a ſound he makes, awakes them, they preſently catch their hindmoſt feet in their mouth, and ſo roule down the hill into the ſea like round hoops or wheels. The cunning alſo of the Cuttle fiſh, or Sepia may be alledged here, who to delude the fiſherman, thickneth the water with his black ink, and ſo eſcapeth; The Torpedo, and other fiſhes may be produced for examples of their cunning, and the Dolphins for their docilitie, but theſe may ſuffice.

VI. Though God hath given to ſome fiſhes feet, and wings, as well as fins, yet not in vain; for theſe Amphibia that were to live on the land as well as in the water, ſtood in need of feet for walking as well as of fins for ſwimming; and thoſe winged fiſhes being not ſuch ſwift ſwimmers, as to eſcape the dangers of their enemies, the Ducades, by their fins, were to avoid them by their wings; hence being purſued in the water, they fly in the air till they be weary, or far enough out of danger, then they fall down into the water again. 'Tis commonly thought that they fly ſo long as their wings are moiſt; and fall down when they are drie; but I ſee no reaſon why moiſture ſhould help their flight, when it hinders the flying of birds, which fly ſwifteſt when their wings are drieſt: Swallows indeed

deed and other birds, do ſometimes wet their wings, not to help their flight, but to cool and refreſh their heat.

VII. That there are many monſtrous fiſhes in the ſea, is not to be denied in a grammatical ſenſe, nor in a Philoſophical, if we ſpeak of individuals; for in ſuch both by land and ſea, there be divers aberrations of nature; though there can be no ſpecifical monſters except we will make the firſt cauſe to haye erred in his own work, and firſt production of things; yet in a grammatical ſenſe, even the ſpecies of ſome fiſhes may be called monſters, *à monſtrando*, for their hidious and uncoth ſhapes demonſtrate Gods greatneſſe and power, and his goodneſſe alſo, in that he makes them to ſerve our uſes, and they may alſo demonſtrate what ſhould be our dutie to God, when we look on them, even to praiſe and honour him, who hath not made us like one of them. The whale then to us is a monſtrous creature, when we look upon his huge bulk, and ſtrange ſhape, and motion, the quantity of water, and manner of ſpouting it like flouds out of his head; for each whale hath a prominent ſpout on his head, and ſome have two, (though Dr. *Brown* denies it, yet *Olaus* an eye-witneſſe proves it) by theſe pipes they breath, and ſend out the water which they drink in: and it is none of the leaſt wonders that theſe vaſt creatures ſhould be caught and ſubdued by the art of man. In *Norway* they are taken by the ſmell of Caſtoreum, which ſtupifieth their ſenſes; in the *Indies* they are taken by ſtopping their holes and vents by which they breath, ſo that being ſtifled they ſubmit to the poor naked conquering *Indian* who ſits upon him, as on horſeback, and with a cord drawes him to the ſhore. *Acoſta* tels us of a ſtrange fiſh called Manati, which ingenders her young ones alive, hath teats and doth nouriſh them with milk, it feeds on the graſſe, but lives in the water; it is of a green colour, and like a cow in the hinder parts, the fleſh is in colour and taſte like veal. The Shark or tiburon is a ſtrange fiſh, out of whoſe gullet he did ſee drawn, a butchers great knife, and great iron hook, and a piece of an oxes head, with one whole horn, their teeth are as ſharp as raſors, for he ſaw Sharks leap out of the water, and with a ſtrange nimbleneſſe ſnap off both the fleſh and bone of a horſes leg hanging upon a ſtake, as if it had been the ſtalk of a lettice. That was a monſtruous fiſh which *Scaliger* ſpeaks of, having a hogs head with two horns, and but one bone in all its body, on whoſe back was a bunch reſembling a ſaddle. In the lake *Amara* of *Ethiopia* is a kind of Conger having a head like

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a toad, and a skin of partie colours. In the *Ethiopian* ſea is a fiſh reſembling a hog in his head and skin, vvith long ears, and a tail of tvvo foot in length. No leſſe monſtruous is the Hippocampus, a fiſh like a horſe in his head and neck, having a long main, the reſt of his body is like our painted dragons. He ſpeaks alſo of a fiſh like a leather purſe vvith ſtrings, vvhich vvill open and ſhut. There is a fiſh having the reſemblance of a calves head vvith horns. There are fiſhes that have four ranks of teeth, and in every rank fifty teeth. *Rondoletius* ſpeaketh of fiſhes in vvhoſe bellies have been found men arm'd at all aſſaies. The Uletif is a fiſh having a ſavv on his forehead three foot long and very ſharp. *Thevet* tels us of a fiſh in the *Sarmatique* ſea, having horns like thoſe of a hart, on the branches vvhereof are round buttons ſhining like pearl, his eyes ſhine like candles, he hath four legs, long and crooked pavves, vvith a long ſpeckled tail, like the tail of a Tigre, his muzzle round like a cats, vvith mouſtaches round about. There are ſea-ſerpents of tvvo hundred cubits long. Some fiſhes have been found reſembling mitred Biſhops, others hooded monks, and divers more ſhapes there are: but none more ſtrange then that vve read of in the Storie of *Harlem* in *Holland*, out of vvhoſe lake vvas fiſh'd a ſea-vvoman, vvhich by a ſpring tide had been carried thither, vvhen ſhe vvas brought into the Tovvn, ſhe ſuffered her ſelf to be clothed, and to be fed vvith bread, milk, and other meats, ſhe learned alſo to ſpin, to kneel before the crucifix, and to obey her Miſtreſſe, but ſhe could ne-be brought to ſpeak, and ſo remained for divers years dumb. They that vvill ſee more of fiſhes, let them read *Ariſtotle*, *Pliny*, *Olaus Magnus*, *Arbian Oppian*, *Rondoletius*, *Geſner*, *Aldrovandus*, *Belon* and others.

CHAP II.

1. *Publick and privat calamities preſaged by owles.* 2. *By dogs.* 3. *By ravens, and other birds, and divers other ways.* 4. *Wiſhing well in ſneezing, when and why uſed.* 5. *Divers ſtrange things in thunder-ſtruck people.*

THat deſtruction and mortality are oftentimes preſaged by the skrieching of ovvles, the houling of dogs, the flocking together and combating of ravens, and other birds, and by divers other ominous ſignes, is no Gentil ſuperſtition, or

Vulgar

Vulgar Error, as Dr. *Brown* (*Book* 4. c. 21.) vvould have it, but a truth manifeſted by long experience. *Lampridius* and *Marcellinus* among other prodigies, vvhich preſaged the death of *Valentinian* the Emperor, mention an ovvle vvhich ſate upon the top of the houſe, vvhere he uſed to bathe, and could not thence be driven avvay vvith ſtones. *Julius Obſequens* (in his book of Prodigies c. 85.) ſhevves that a little before the death of *Commodus Antoninus* the Emperor, an ovvle vvas obſerved to ſit upon the top of his chamber, both at *Rome*, and at *Sanuvium*. *Xiphlirus* ſpeaking of the prodigies that vvent before the death of *Auguſtus*, ſaith that the ovvle ſung upon the top of the Curia: βύας κεφαλήνεος ἔβυξε, &c. he ſhevvs alſo that the *Actian* war was preſignified by the flying of owls into the Temple of Concord in the year 1542 at *Herbipolis* or *Wirtzburg* in *Franconie*, this unluckie bird by his ſchrieching ſongs affrighted the Citizens a long time together, and immediately followed a great plague, War, and other calamities: *Pliny* (*lib.* 10. c. 12.) ſhews that this abominable and funeral bird, as he calls it, portended the *Roman* deſtruction at *Numantia*; and therefore one time being ſeen in the Capitol, ſo affrighted the City, that *Rome* vvas purified to prevent the evils vvhich that ovvle preſaged. *Balthaſar Coſſa*, vvho vvas Pope and named *John* the 24th vvas forevvarned by an ovvle (that appeared over againſt him as he ſat in Councel) of the troubles vvhich juſtly fell on himſelf, and by his means on others. About 20 years ago, I did obſerve that in the houſe where I lodged, an Owl groaning in the window preſaged the death of two eminent perſons who died there ſhortly after. Therefore not without cauſe is the owl called by *Pliny*, *Inauſpicata & funebris avis*, by *Ovid*, *Dirum mortalibus omen*, by *Lucan*, *ſiniſter bubo*; by *Claudian*, *infeſtus bubo*. and the Prince of Poets, among other ominous portenders of *Q. Dido's* death, (*Æn.* 4.) brings in the owls ſchrieching and groaning.

Solaq; culminibus ferali carmine bubo
Sæpe queri, & longas in fletum ducere voces.

And in another place he makes the owl preſage the death of *Turnus*, *Æn.* 12.

Quæ quondam in buſtis, aut culminibus deſertis
Nocte ſedens ſerum canit importuna per umbras.

II. That dogs alſo by their howling portend death and calamities,

lamities, is plain by Hiſtorie and experience. *Julius Obſequens* (*c.*122.) ſheweth that there was an extraordinary howling of dogs before the ſedition in *Rome*, about the Dictatorſhip of *Pompey*, he ſheweth alſo (*c.*127.) that before the civil Wars between *Auguſtus* and *Antonius*, among many other prodigies, there was great howling of dogs, near the houſe of *Lepidus* the Pontifice. *Camerarius* tels us (*c.*73. *cent.*1.) that ſome *German* Princes have certain tokens and peculiar preſages of their death, amongſt others are the howling of dogs. *Capitolinus* tels us that the dogs by their howling, preſaged the death of *Maximinus*. *Pauſonius* (in *Meſſe.*) relates that before the deſtruction of the *Meſſenians*, the dogs brake out into a more fierce howling then ordinary, βιολογ. τῇ κρωυγῇ χρώμενοι, and we read in *Fincelius* that in the year 1553, ſome weeks before the overthrow of the *Saxons*, the dogs in *Myſina* flock'd together, and uſed ſtrange howlings, in the woods and fields. The like howling is obſerved by *Virgil*, preſaging the *Roman* calamities in the *Pharſalick* War:

Obſcœniq; canes, importunæq; volucres
Signa dabant.———

So *Lucan* to the ſame purpoſe: *Flebile ſævi latravere canes*: and *Statius*: *Noctturniq; canum gemitus.*

III. By ravens alſo and other birds, both publick and privat calamities and death have been portended. *Jovianus Pontanus* relates two terrible skirmiſhes between the ravens and the kites in the fields lying between *Beneventum* and *Apicium*, which prognoſticated a great battel that was to be fought in thoſe fields. *Nicetas* ſpeaks of a skirmiſh between the crowes and ravens, preſignifying the irruption of the *Scythians* into *Thracia*: The cruel battels between the *Venetians* and *Inſubrians*, and that alſo between the *Liegeois* and the *Burgundians*, in which above 30 thouſand men were ſlain, were preſignified by a great combat between two ſwarms of emmets: In the time of King *Charls* the 8 of *France*, the battel that was fought between the *French* and *Britans*, in which the *Britans* were overthrown, was foreſhewed by a skirmiſh between the magpies and jackdaws. I have read alſo of skirmiſhes between wild-ducks and wild-geeſe; likewiſe between water and land ſerpents, premonſtrating future calamities among men. In this land of late years our preſent miſeries and unnatural wars, have been forewarned by armies of ſwallows, martins, and o-

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ther birds fighting againſt one another: And that privat men have been forewarned of their death by ravens, I have not only heard and read, but have likewiſe obſerved divers times: a late example I have of a young gentleman, Mr. *Draper* my intimate friend, who about five or ſix years ago, being then in the flower of his age, had on a ſudden one or two ravens in his chamber, which had been quarrelling upon the top of the chimney; theſe he apprehended as meſſengers of his death, and ſo they were; for he died ſhortly after. There is then no ſuperſtition in the obſervation of ſuch things; for God is pleaſed ſometimes to give men warning of their ends by ſuch means; ſo we finde in the life of *Cicero*, who was forewarned by the noiſe and fluttering of the ravens about him, that his end was near; which proved true, for the murtherers ſent by *Mark Antonie* ſlew him preſently after in his Sedan: Why may not God forewarn men of their future death and calamities by birds, as well as by generation of monſters, apparition of comets, ſtrange ſhowres of frogs, blood, ſtones, and ſuch like; I ſaw a little before theſe laſt troubles of *Germany*, divers *Parſeleons*, or *Moors* with croſſes in the air, not long before the appearing of the laſt blazing ſtar. Why is it leſs ſuperſtitious to obſerve ſuch uncouth meteors, then uncouth actions of birds and beaſts, or why is there leſs credit to be given to the one then the other, ſeeing God can make uſe of all his creatures as he pleaſeth: therefore he that imployed a raven to be a feeder of *Elias*, may employ the ſame bird as a meſſenger of death to others. *Camerarius* out of *Dietmarus* and *Eraſmus Stella*, Writes of a certain fountain near the river *Albis* or *Elbe* in *Germany* which preſageth Wars by turning red and bloudy coloured. Of another which portendeth death, if the water which before was limpid, becomes troubled and thick, ſo cauſed by an unknown Worm. There is a noble Family in *Bohemia* vvhich is forevvarned of death, by a ſpectrum or ghoſt appearing like a Woman cloathed in mourning. Such an apparition had Mr. *Nicholas Smith* my dear friend, immediatly before he fell ſick of that feaver vvhich killed him: having been late abroad in *London*, as he vvas going up the ſtairs into his chamber, he vvas embraced as he thought by a Woman all in vvhite, at vvhich he cried out, nothing appearing, he preſently ſickneth, goeth to bed, and vvithin a vveek or ten days died. Novv vvhether theſe things be true and real, or only imaginary in the phantaſie, I vvill not here diſpute; it is ſufficient that by ſuch means many are forevvarned of their ends,

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as *Brutus* was in his Tent, to whom his evill Genius appeared the night before he died. And why may not our tutelary Angel by theſe and ſuch like means, give us warning of our diſſolution? We read in Hiſtories of a Crow in *Trajans* time, that in the Capitoll ſpoke, ἔσαι πάντα καλῶς, All things ſhall be well. And St. *Hierom* tels us, that the Ravens fed the two Eremites, *Paul* and *Anthony* many yeares together with bread. The ſame God that imployed theſe birds as Stewards to feed his ſervants, may alſo uſe them as meſſengers to warn them of their migration. And yet in this I doe not patromize the heathen augurations, who in all their actions depended ſuperſtitiouſly upon the chattering, flying, and feeding of birds, then the which nothing could be more vain, ſeeing they cannot naturally foreknow the death of others, who cannot fore ſee their own; as that *Roman* Commander made appeare to his Army, who ſhot the bird dead, by whoſe chattering the Augur would have hindered the Armies march. Yet from hence it will not follow, that all obſervations of meteors or animals are ſuperſtitious, or that they do not fore-warn at all death and future calamities, ſeeing Hiſtorie and experience teach the contrary: and Chriſt ſheweth, that before the deſtruction of *Jeruſalem* there ſhall be ſignes from heaven in the Sun, Moon, and Starres, and Sea, which *Joſephus* confirmes. *Obſequeus* tells us, That at *Rome* was extraordinary thundring immediatly before *Catilines* conſpircy; the like was before the *Pharſalick* battel, as the *Roman* Stories inform us: in which alſo we find, that before the invaſion of *Italy* by the *Goths* under *Alaricus*, by the *Huns* under *Attila*, and by the *Lombards* there was more then uſuall thundring and lightning, preſaging the calamities that were to fall on that Countrey. And this very houre that I am writing this diſcourſe, (*Aug.* 23 *anno* 1651.) I obſerve that it hath continued thundring and lightning almoſt 14 hours with ſome ſhort interruptions; whereas uſually thunder laſteth not above an houre or two: By which I fear me God is forwarning this Land of the horrible bloodſhed and calamities which are ſuddenly like to fall out among us, which we beſeech God in his mercy to avert, and to give us all repenting and relenting hearts.

IV. That ſneezing or ſternutation was ſuperſtitiouſly abuſed by the Centiles in divination, is manifeſt by their writings, who uſed to fore-tell good or bad events by ſneezing: they held that propitious which was in the afternoon, and towards the right hand; but to ſneeze in the morning, or towards the

left hand, was counted unlucky, as *Ariſtotle* ſheweth. So ſuperſtitious they were, that if they ſneezed whilſt they were riſing in the morning, they would to bed again; and if any ſneezed at Table whilſt the meat was taking away, they would ſet down the meat again. If the Generall of an Army did ſneeze when he was going to fight, he would forbeare fighting that day, ſuch an ominous thing they held ſneezing to be. On the other ſide, at *Monopotama* ſternutation was of ſuch high eſteem, that when the King ſneezed, all the people would fall down and worſhip him; and proclamations were ſent abroad to give notice to all the Kings ſubjects of his ſneezing, to the end they might rejoyce and worſhip. Among the reſt of the Gentiles ridiculous opinions, this was one, That *Prometheus* was the firſt that wiſht wel to the ſneezer, when the man which he had made of clay, fell into a fit of Sternutation upon the approach of that celeſtiall fire which he ſtole from the Sun. This gave originall to that cuſtome among the Gentiles in ſaluting the ſneezer. They uſed alſo to worſhip the head in ſternutation, as being a divine part, and ſeat of the ſenſes, and cogitation. They held alſo ſternutation one of their gods: & becauſe their chiefeſt ſoothſayings and divination was by Birds, hence ſternutation was called ὄρνις a Bird by them: & by reaſon it is the action of the brain which is the ſeat of the ſenſes, therefore in *Ariſtophanes* the word ſneezing is uſed for feeling; as when he ſaith, *I ſneezed not the blow*, his Interpreter expounds it, *I felt it not*, as *Cælius* obſerveth. But now becauſe the Gentiles abuſed ſneezing ſuperſtitiouſly, and wiſhed well to the Sneezer, we muſt not hence inferre, That to pray for the ſafety of him who ſneezeth, is ſuperſtition or Gentiliſme, as ſome do: for ſo we may conclude by the ſame reaſon, that to pray at all is ſuperſtition, becauſe the Gentiles uſed to pray. It is an ancient cuſtome among Chriſtians to wiſh well to him that ſneezeth, taking its originall from the time of St. *Gregory*, when at *Rome* in a great ſickneſſe, men died with ſneezing. Doctor *Brown* out of *Fernandes* brings ſome proofes to ſhew, that the original of wiſhing wel to the ſneezer, is more ancient then *Gregory*; to whom I anſwer, That it was uſed among the Gentiles before *Gregories* time; but I deny that it was uſuall among Chriſtians till then. From this ſickneſſe therefore at *Rome* in *Gregories* dayes, in which this wel-wiſhing was uſed, and not from the Gentiles practice, we draw this civill and charitable cuſtome in praying for our friend or neighbour when he ſneezeth.

V. In thoſe that are thunder-ſtruck, divers things are remarkable, as, 1. They keep the ſame poſture of body being dead, which they had when they were alive at the time when they were ſtruck, as *Cardan* (*de rer. var. lib. 8. c. 44.*) inſtanceth of 8 harveſt people in the Iſle *Lemnos*, who ſitting together under an Oak at ſupper, were all thunder-ſtruck, retaining the ſame poſture they had before; one with his hand on the cup ready to drink, the other with the cup at his mouth; a third with meat in his mouth; ſo that they looked like ſo many ſtatues. The reaſon of this may be the ſtifneſſe of the nerves and muſcles, being parched and dried up by the hot and ſulphury matter of the lightning. The like I read of thoſe that are killed with exceſſive cold, which ſo ſtiffeneth thoſe parts mentioned, that the body retains its poſture whether ſitting or ſtanding. 2. They that are thunder-ſtruck look black, becauſe the heat drieth up the radicall moiſture. The like we ſee of fire, which makes the whiteſt paper and linnen grow black, and the Sun tans mens skins. 3. Their bodies do not putrifie, by reaſon their moiſture, which is the mother of putrifaction, is exhauſted. 4. There is neither wild beaſts nor ravenous birds will touch or come neere ſuch bodies, becauſe of their ſulphury ſmell which is noiſome to them, and their drineſſe is ſuch, that they can afford no nutriment. 5. That part which is wounded by the thunder, is colder then any other, notwithſtanding that the lightning or thunder is of a fiery nature; becauſe all things which have been heated by the fire, grow colder then before, by reaſon the inward heat is drawn out by the fire; for in things of the ſame nature or quality, the ſtronger attracts the weaker. 6. The *Romans* never ſuffered their bodies to be burned that were thunder-ſtruck, but covered them with earth in the ſame place where they were ſtruck, or let them remain unburied, nor would they ſuffer any funeral obſequies to be performed to them: perhaps they thought it unfitting to burn thoſe with terreſtriall fire, who had been ſcorched already with fire from heaven, or to take the ſhape away, or figure of that body with their fire which the celeſtiall fire had ſpared: nor would they honour him with a a funerall whom they thought execreable, and extreamly hated of the gods: therefore none would venture to come neer the place, till it was expiated by a ſacrifice, which was called *Bidentall*, being a ſheep of two years old, or of two eminent teeth; which word alſo by *Perſius*, is given to the party that is thunder-ſtruck, whom he calls *exitiandum Bidentall* (*Sat.*

2.) becauſe none durſt touch or come neer him. 7. The thunder ſeldome or never kills thoſe that are aſleep, but ſuch onely as are awaked: this may proceed from the fear which is in thoſe that are awaked, by which the ſpirits & blood ſuddenly ſuffocate the heart, whereas in ſleep there is no fear or apprehenſion of danger; and not only men, but cattell alſo are much affrighted: wherefore in thundring times the ſhepheards uſe to gather their ſheep together, that being united, they may be the leſſe fearfull, whereas any creature alone is ſubject to be fearfull. 8. It is a ſtrange quality in the thunder to break the bones, to melt the ſword, to dry up the wine, to kill the infant in the womb, and yet not touch the skin, the ſcabbard, the barrell, nor the mother; perhaps the skin and leather being pory, tranſmits the ſulphury vapour, which is reſiſted by the bones and metall. As for the wine exhauſted, I think *Pliny*, *Plutarch*, and others, mean onely the Spirits of the wine evaporated; and ſo the child being more tender and apter to receive the malignant vapour of the thunder then the mother might die and ſhe live.

CHAP. III.

1. *The Female hath no active ſeed of generation. Doctor* Harvies *and* Fernelius *reaſons refuted.* 2. *A Diſcourſe of the Cholick.* 3. *The ſame ſoul in a ſubventaneous and prolificall egge. Doctor* Harvies *reaſons to the contrary refuted.* 4. *Blood not the immediate inſtrument of the Soul, Doctor* Harvies *reaſons anſwered.* 5. *Doctor* Harvies *way of conception refuted.*

WE have proved already (*l.*1.*c.*4.*ſect.* 3.) that the female hath no active active ſeed for generation, but is meerly paſſive, affording onely blood, and the place of conception, according to the truth of *Ariſtotles* doctrine; but becauſe the Phyſicians are of another opinion, that the female hath alſo ſeed actively concurring to generation, we will examine the ſolidity of their reaſons. 1. Doctor *Harvy* (*Exercit.* 32.) proveth, That in the female there is an active principle of generation, *Becauſe of the Horſe and Aſſe is procreated a mixt ſpecies, to wit, the Mule, the whole form whereof is made up and mixed of both parents; ſo that the Horſe alone was not ſufficient to produce this form of the Mule in the matter, but as the whole form is mixed, therefore the Aſſe muſt concurre as an other efficient cauſe. Anſw.* The Mule is not a compounded ſpecies, or mixed of the Horſe and Aſſe,

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but rather a third ſpecies different from both, as having neither in whole nor in part, nor ſeparated, nor mixed, their eſſentiall forms, but hath its own ſpecificall form, and properties diſtinct from thoſe of the parents, as we may ſee in the Mules ſterrility, which is a property not individuall as in ſome other animals; but ſpecificall, of which the ſpecies of the Horſe and Aſſe is not capable. As for ſome outward reſemblances in the Mule to the parents, theſe are but accidentall, and are in animals of farre different ſpecies, as alſo in trees, and other vegetables. Beſides, the forms or ſpecies of things cannot be mixed, becauſe eſſences are impartible, and admit no intentions nor remiſſions: the form then being ſimple and indiviſible, cannot be made up of two, ſo that two ſeeds cannot concurre as two efficient cauſes to make up a third entity. For, *Ex duobus entibus per ſe, non fit unum ens per ſe.* Again, wee ſee that trees and plants are generated of one ſeed without copulation; for the earth concurres, not by affording another ſeed to propagate, but as the matrix to cheriſh and foment. So in fiſhes, which have no diſtinct ſex, there is generation, notwithſtanding, becauſe in them there is ſeed, which is the onely active principle of generation. Again, that outward ſhape or form which the Mule hath, was not induced by the formative faculty of the females ſeed; for there is none, as we have ſhewed, much leſſe of the blood, for the plaſtick vertue reſideth not in the blood, but in the Males ſeed; which of its own particular nature endeavours to form a Horſe, but finding the Aſſes blood (being united now and coagulated with and by the Horſes ſeed, uncapable to receive that form of the Horſe, is retreated by the ſuperior and generall formative faculty, which aiming at the production of a new ſpecies for the perfection of the Univerſe, generates a Mule. Hence we may inferre, that Mules were not the invention of *Ana*, except we will conclude, that the world was imperfect till that time, which were an injury to God who made the world perfect; but perfect it could not be till the production of this ſpecies: for *Perfectum eſt cui nihil deeſt.* The Doctors ſecond Argument, (*Exercit.* 34) is taken from the production of the egge, which *Ariſtotle* holds is generated by the Hen, and which hath alſo vegitation from her. Hence he inferres, *That according to Ariſtotles mind, the Hen is an active principle in generation. Anſw.* From hence it will not follow, That the Hen is an active principle in the generation of the Chick, becauſe ſhe furniſheth the Egge, which is the materials of the chick; for ſo in other animals the

female furniſheth blood, which is the matter of which the Embryo is made; and yet ſhe is not, as we have ſaid, an efficient cauſe of generation, but the male onely by his ſeed; neither will it follow, that vegitation doth ſtill preſuppoſe generation; for in many individuals there is a vegitive ſoul, and yet no generation, ſo there is in ſome ſpecies, as in Mules, in *adianthum* or *capillus veneris*, which we call *Maiden-hair*, and divers other hearbs which generate not, though they have vegitation. But when *Ariſtotle* ſaith, The egge is generated in the Hen, or that the female generates in her ſelf, he takes generation in a large ſenſe, for any way of production; ſo we ſay water is generated of air, and worms of putrid matter, and yet neither the one nor the other is the efficient, but the materiall cauſe onely of generation. And though we ſhould yeeld that the Hen were the efficient cauſe of the egge, yet it will not therefore follow, that ſhe is the efficient cauſe of the Chick, for that is onely the Cock, as *Ariſtotle* holds: though in the woman there is a working faculty of her blood, yet there is no working faculty in her of the child or Embryo; that is meerly from the plaſtick power of the fathers ſeed.

II. Now let us ſee *Fernelius* his Arguments, (*l. 6. de hom. procreat.*) the firſt whereof is this, *The womans ſeed hath no other originall from the teſticles and veſſels then the males ſeed hath, therefore in her ſeed there is a procreative faculty.* *Anſw.* 1. We deny that there is ſeed in the woman properly ſo called. 2. If it were ſo that ſhe had ſeed, yet it will not follow that it is prolificall; for it muſt be concocted & ſpirituous, becauſe the ſpirits are the prime inſtruments of Nature in generation: but the the womans ſeed is crude, becauſe that Sex by nature is cold, being compared to the man, as both *Ariſtotle* and *Galen* affirm, and experience doth evince; for the woman is much weaker and ſlower then the man, whereas ſtrength and agility argues plenty of ſpirits and calidity: The mans hairs alſo are more curled, ſtiffe and ſtrong then the womans, which ſhews more heat. The womans voyce is weaker and ſmaller, which argues the narrowneſſe of the veſſels, and conſequently defect of heat, and becauſe the woman is leſſe hot and dry then the man. Hence it is that ſhe abounds much more in blood, which in man is dried up. Beſides, the woman is the more imperfect Sex, her ſeed therefore muſt be imperfect, and conſequently not fit to be the principall or efficient cauſe of ſo noble an animall as man. *Ariſtotle* obſerveth, that boyes in the mothers womb are more lively, and nimbler then maids, that they

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are ſooner formed in the matrix, and that the woman ſooner groweth to her height, and ſooner decayeth, her ſtrength quickly fails her, and old age aſſaults her ſooneſt. Secondly, he proves, *That the child drawes the Gout, Stone, Epilepſie, and other hereditary diſeaſes from the mother, who was ſubject to theſe her ſelfe.* *Anſw.* This will not prove that the mother is an active cauſe in generation, or that the formative faculty is the cauſe of diſeaſes, which rather are to be attributed to the matter of which the ſimilar parts are formed, then to the active principle of generation; whereas then the woman furniſheth blood, of which our bodies are made up, it is no marvell if with the blood ſhe imparts to the child whatſoever infirmitie is in it, and not onely doth the mother by her blood, but the father alſo by his ſeed, communicate diſeaſes to the child: for the ſame ſeed which is the efficient cauſe of generation, is alſo the materiall cauſe of infirmities and diſeaſes. Hence many times gowty fathers beget gowty children. His third Argument is, *The child oftentimes reſembleth the mother, therefore her ſeed muſt needs be active.* *Anſw.* That the child for the moſt reſembleth the mother, proceedeth not from any agencie of her ſeed, but from the ſtrength of her imagination; for otherwiſe the child would ſtill reſemble the father, in whoſe ſeed alone reſideth the formative faculty, which becauſe it is a naturall power depending from the generative, and conſequently inferior to the imagination, which is an animall faculty that giveth place to this. This force of the mothers imagination is plain by the divers impreſſions made on the tender Embryo upon her depraved imaginations, by the ſtories of thoſe women who have conceived children reſembling the pictures hanging in their bed-chambers, and by the practiſe of *Jacob*, *Gen.* 30. in cauſing his Ewes to bring forth ſtreaked Lambs, according to the ſtreaked rods put in their troughes when they drank.

II. There is no diſeaſe that more moleſts and tortures man then the Cholick, which is ſo called from *Colon*, the great inteſtine; the torment of which hath made ſome to kil themſelvs: nor is there any malady that proceeds from more cauſes, or hath more ſtrange and various cures: ſometimes it proceeds of intemperance in eating and drinking; ſometimes from the quality of the meat and drink we uſe; ſometimes alſo from the malignity of the medicament we take: In ſome it is cauſed by choler in the inteſtine, in others by flegme, in others by flatulency: In ſome upon coſtiveneſſe and retention of the feces: in others upon fluxes and too much evacuation: In others a-

gain it is procured by the rupture of the *Peritonæum*, and lapſe of the inteſtine into the *Scrotum*. Sometimes this diſeaſe is procured by the diſtemper of ſome adjacent part, ſometime by ſtones bred in the inteſtines; ſometimes by wormes generated there; ſometimes by congealed blood in the ſame place; ſometimes by a wind; in many it is cauſed by drinking cold water; in others by ſitting on a cold ſtone, and in ſome by impure venery; ſometimes the malady is in the cavities of the Colon, ſometimes in the tunicles; and ſometimes it is bred by the infection of the air; and ſometimes by the contraction and ſhrinking of the inteſtines. Thus wee ſee of what brittle meterials we are compoſed, how careful we ſhould be of our diet, and how many wayes God hath to puniſh us for ſin. Like to this diſeaſe is the *Iliaca paſſio*, ſo called from the *Ilium*, a ſmaller inteſtine, which is ſometimes ſo violent and the obſtructions below ſo great, that the excrements for want of paſſage downward, recoil upward by vomiting. Many likewiſe are the ways by which the Cholick is cured. For, beſides the ordinary ways of curing by purging, vomits, clyſters, phlebotomy, and outward fomentations, there be divers extraordinary wayes, ſome are cured by the ſmoke of Tobacco uſed downward; ſome have been eaſed by blowing of wind out of a paire of bellows into the inteſtine, for dilatation thereof; ſome are cured by drinking of urine, ſome by the Wolfes excrement dried and powdred, and mixt with white Wine, ſome by the Wolfs gut, dried, powdred, and drunk with Canary or Malago: others have been cured & preſerved by carrying about them the Wolfs excrement, the fleſh of a Lark either boyled or burned into aſhes, and ſo taken in three ſpoonfuls of warm water, hath cured ſome. The *Thracians* uſed to cure themſelves of this diſeaſe, by carrying about them the heart of a Lark, being taken out whilſt he was alive. A Goats liver is commended by ſome for a preſent remedy, if it be burned, powdred, and drunk in wine. Some commend the infants navel-ſtring being cut off, ſalted, & carried in a Box. Others have found good by a hogges blind gut worn about them; the decoction of Mints by ſome, and of Horehound by others, are held ſingular remedies, ſo are ſnakes, if they be burned, powdred, and drunk in wine. Some have been eaſed by drinking ſnow and ſuger, and by applying of cold ſnow to the part that was pained. A Bulls pizle is commended by ſome for a preſent help, if it be powdred, a ſcruple whereof in Malago wine will give eaſe. Some have been cured by drinking down quick-

ſilver,

ſilver; and experience ſhews us, that ſwallowing of golde nor leaden bullets, are preſent helps, becauſe with their weight they open the paſſages and make way. I have eaſed my ſelfe of that pain by drinking white Wine in which onions have been ſteeped all night. Thus as God hath divers ways to puniſh us, ſo he hath as many wayes to eaſe us, & that very ſtrangely: for who can give a reaſon of thoſe occult qualities or antipipathies which are between this malady, and moſt of theſe remedies now mentioned? But of this ſee *Fracaſtorius*, *Foreſtus*, *Fernelius*, *Fonſeca*. *Zacuta*, *Rondeletius*, and other Phyſicians.

III. That there is the ſame ſoule in a ſubventaneous egge which is in a prolificall, may appear by the ſame properties and effects in both, becauſe in both is accretion, nutrition, attraction, retention, concoction, &c. which are the effects of the vegetive ſoul; yet Doctor *Harvy* (*Exercit.* 25.) denies this, Becauſe (ſaith he) *If there were the ſame ſoule in the ſubventaneous which was in the prolificall egge, they would both equally produce Chickins,* " *Anſw.* This will not follow, except he could prove that the vegitive ſoule produceth the ſenſitive ſoule, or the ſenſitive creature, which cannot be; for no ſoule can produce another, neither can an inferior faculty produce a ſuperior, by reaſon the effect cannot be more noble then the cauſe: The reaſon then why the ſubventaneous egge is not prolificall, is not the want of a vegive ſoule, which we know it hath by the effects thereof; but becauſe that egge was not animated or fecundated by the prolificall ſperm, ſeminall ſpirit, or ſpermatick vapour of the Cock. So the blood in a married woman and a maid, hath the ſame vegitation, though both be not prolifical for want of the mans improlificating ſperm. But the Doctor tells us, (*Exercit* 25.) *That from the male proceeds onely the plaſtick or formative vertue which fecundateth the egge, becauſe the ſeed or geniture cannot penetrate into the Hens matrix, or inward receptacles.* *Anſw.* The formative vertue being an accident, cannot be derived or conveyed from the Cock to the Hens matrix, without its proper iubject, in which it is inherent. And though in a dead Hen thoſe paſſages or conveyances cannot appear, yet in the living Hen they are open for the ſeminall vapour to paſſe. For this cauſe in the cloſure of the Cocks treading, there is a nimble and almoſt imperceptible touch of both their fundaments, by which then the ſeminall ſpirit is conveyed. Again, the Doctor ſaith (*Exersit.* 25.) *That whereas the ſoule is the act of an organicall body, having life potentially, it is incredible that it ſhould be in a Chick before any part of its body be-*

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organized. Anſw. The egge is not altogether a body inorganicall actually, ſeeing it hath different parts. Beſides, it is organicall potentially, as containing in it all the parts and members the Chick that ſhall bee. So the ſeed of other animals contains potentially the animall that ſhall be, with all its members; therefore the common opinion is, that ſeed is drawn from all parts of the body, becauſe it contains in it all the parts. As the ſoul then is in that body which hath life potentially, that is, a poſſibility to exerciſe the functions of life; ſo it is in the body that hath organs potentially, or the faculty of producing organs. Hence the ſoule cannot be in a ſtone, which hath not this poſſibility. Of this opinion is the Doctor (*Exer.*71) when he ſaith, *That in the primogeniall humidity of the egge, all the parts of the chick are potentially, but none actually.* Again, he ſaith, *Exer.*25. *That in the egge and chick there cannot be the ſame ſoule, becauſe they are different entities, & produce different, yea contrary operations, ſo that the one may ſeem to be begot of the others corruption. Anſ.* I deny that the egg & chick are different entities otherwiſe then *ſecundum magis & minus*, as an imperfect thing differs from it ſelfe, when it becomes more perfect; in this reſpect an infant and a man may be called different entities, and they have their different operations; yet they have the ſame ſoule. If then we conclude diverſities of things from diverſities of operations, we muſt inferre that every animall is different from it ſelf, becauſe it produceth different operations, and that *Peter* hath not the ſame ſoule when he doth different things. How many different entities muſt there be in the Sunne, who produceth ſo many different effects. Neither do I allow of the Doctors Aſſertion, in ſaying, *The chick is begot of the egges corruption*; for indeed it is begot of the egges perfection: For then is the egge perfected when the chick is procreated. If by corruption he underſtand the abolition of the form of the egge, I aſſent to him, that according to the old Peripatetick Maxime, *The corruption of one thing is the generation of another.* But if by corruption he underſtand putrifaction, as he ſeems to doe, I ſay that then a chick is not, nor cannot be procreated of a putrified egge, which is fitter to breed worms then a Chick.

IV. Becauſe the ſoule is a pure and celeſtiall ſubſtance, and our bodies are groſſe and earthy, on which ſo ſublimate an entity cannot operate without a *medium*, that may in ſome ſort participate of both natures, therefore God in his wiſdom hath interpoſed the animall and vital ſpirits as the immediate inſtruments

ments of the ſoul to work upon the body. But Dr. *Harvy* (*Exercit.* 70) *will have the blood to be this immediat inſtrument of the ſoul, becauſe it is every where preſent, and runs to and fro with great celerity. Anſw.* Neither can the blood be the immediat inſtrument of the ſoul, becauſe the ſpirits being of a purer eſſence, come nearer to the nature of the ſoule, and therefore muſt be more immediat; neither is there any ubiquitary preſence or celerity of motion in the blood, but by the reaſon of the ſpirits which drive it to and fro. Beſides, all animals have not blood, ſome being exanguious, yet they have ſpirits by which they are moved. Again, he ſaith, *That the blood works above the power of the elements, being the part firſt begot, and the innate heat doth fabricate the other parts of the body. Anſw.* The blood works not at all, much leſſe above the elementary powers, but by vertue of the ſpirits; which the Doctor immediatly after ſeems to acknowledg, when he ſaith, *It is made the immediate inſtrument of life, by the gift of the formative faculty and vegetive ſoule.* Now this formative faculty conſiſteth immediatly in the ſpirits, and ſo doth the vegitive ſoule, which are even in thoſe parts where there is no blood at all, to wit, in the ſpermaticall parts, according to the doctrine of *Hippocrates* and *Galen.* To ſay then that the blood is the immediat inſtrument of life, by means of the plaſtick faculty, is in effect to ſay, It is not the immediat, becauſe there is one more immediat, to wit, the plaſtick faculty in the ſpirits. Neither is the blood the part firſt begot, as the Doctor ſaith, if we will believe the *Galeniſts*, but the ſpermatick parts are firſt begot, if we ſpeak of the formation of the child: neither can the blood fabricate any part at all, being a dull thing in it ſelfe: but the ſpirits, or the plaſtick faculty in them doe fabricate, the blood is onely the materiall cauſe of the fleſh and ſanguineall parts, as the *Galeniſts* affirm. And whereas the Doctor ſaith, That *the blood is a ſpirit*, becauſe *Virgil* ſaith,

Una eademq; viâ ſanguiſq; animuſq; ſequuntur;

He ſpeaks very improperly, for blood and a ſpirit are ſpecifically different, and if the Poet had meant that blood and a ſpirit were the ſame thing, he had uſed a meer tautologie, which is far from his elegancie; and therefore his words intimate the contrary, that they are different things, becauſe he ſaith, *Sanguiſque animuſque*, though then they had but one paſſage or vent, yet they are not one thing. And whereas he ſaith, That *the blood is celeſtiall, becauſe the ſoule lodgeth in it*, he may ſay the whole body is celeſtiall, being the houſe and tabernacle of the ſoul,

ſoule, which lodgeth in each part thereof, even where there is no blood, as in the bones, griſles, &c. But indeed the ſpirits are rather to be called celeſtiall, becauſe in them the ſoul immediatly reſides, and by them in the blood, and other parts. The blood then is not celeſtial at all, but by the ſpirits, nor theſe in reſpect of their originall, but becauſe of their celeſtial qualities and operations. Again, when he diſtinguiſheth the principall agent from the inſtrumentall in this, *That the one can never work above its own ſtrength, whereas the other doth.* I ſay, this diſtinction is needleſſe; for no agent can work above its own ſtrength, much leſſe the inſtrumentall, which worketh not at all, but as it is moved by the principall agent: The inſtrument then doth not worke above its own ſtrength, but the prime agent worketh by it, above the ſtrength of the inſtrument. Beſides, when hee ſaith, *That the blood deſerves the name of Spirit, becauſe it abounds more with radicall moiſture then other parts, by which it feeds all other parts.* I anſwer, That the ſeed deſerves rather to be called a Spirit; for though in the blood there is more moiſture extenſively, yet in the ſeed there is more radicall moiſture: And if that which feeds us immediatly be a ſpirit, then the blood is no ſpirit; for it is not that, but a roſcid and benigne juice extracted from thence, which immediatly nouriſheth us. Laſtly, when he ſaith, *That the ſoule with the blood performes all things in us*; If he underſtand here (as he ſeemes to doe in all his diſcourſe) collaterall efficient cauſes, I deny his ſaying; for the ſoule by the ſpirits is the ſole efficient cauſe of all that is acted within us, the blood is onely a materiall cauſe, having no more efficiency in it, then Bricks and Mortar have towards the building of an houſe. Doctor *Harvy* (*de Conciptione*) *will have the Female conceive and be prolificall without any ſenſible corporeall Agent, as Iron touched with the Loadſtone draweth other Iron to it.* Again hee ſaith, *That the ſubſtance of the womb being ready for conception, is very like the conſtitution of the brain.* Why then ſhould not their function be alike? And what the phantaſme or apperite is in the brain, the very ſame, or its analogy is excited after copulation in the womb; for the functions of both are called conceptions. And ſhortly after, *As when we have conceived a form or Idæa in the brain, wee produce the like in our workmanſhip; even ſo the Idæa or ſpecies of the Father being exiſtant in the womb by the help of the formative faculty, produceth the like brood.* Then after divers amplifications to the

ſame

ſame purpoſe, he concludes, *That it is no abſurdity if the female that is made pregnant by conceiving the generall Idæa without matter, doth generate.* *Anſw.* In this Tract the Doctor ſeemes ſometimes to be in earneſt, and ſometimes to ſpeak problematically, or rather doubtfully: But however, this opinion cannot conſiſt with reaſon; for what can be more unreaſonable, then that the Nobleſt Animals ſhould be conceived without any ſenſible corporeall Agent, by meere imagination, not of the brain, but of the Womb: For, 1. If this be true, that the Female can thus conceive and generate, what need was there of the Male? they are then uſeleſſe in generation, and fathers have no reaſon to provide for their wives children, ſeeing the woman is the ſole parent, the man but a Cypher. Why ſhould there be any lawes againſt adultery and fornication, ſeeing there can be no ſuch ſins? If this doctrine be true, what miracle was it for a virgin to conceive and bear a Son without the help of man, ſeeing this is ordinary for the female, as the Doctor ſaith, to be prolificall without any ſenſible corporeall agents; for the ſeed, he ſaith, is not received within the matrix. But if I ſhould grant him this (which cannot be true) yet he cannot deny but that the ſeminal vapour and prolificall ſpirit is conveyed thither, by which the female is made pregnant; if he grants this, then there is a ſenſible corporeall agent, though not ſo groſſe as the earthy part of the ſeed: If he deny this, then it will follow, that we are all produced without fathers and that there is no other ſenſible corporeall agent but the womb; and ſo the fifth Commandement of honoring father ſhould be put out, ſeeing there is no ſuch thing in nature. Again, if he ſaith there is no agent, then it will follow, that the effect can be produced without an efficient, and an action without an actor. If he he ſaith there is an agent, but not corporeall, then that agent muſt be either a ſpirit or an accident; if a ſpirit, then we are all the children of ſpirits, not of corporeall parents, and ſo man cannot have for his genus a corporeall ſubſtance. And theſe ſpirits, if created, muſt be either Angels, Demons, or Souls, which was the dreams of ſome ancient Hereticks, long ſince condemned by Councels. If again he ſaith, that theſe agents are not ſpirits, but accidents, he will make us in a worſe condition: For man, the Nobleſt of all creatures, is the child of an accident, therefore *Ariſtotle* ſhould have placed man in the Categorie of quality rather then of ſubſtance. But we know that no accident is operative but in and by the power of the principall agent;

Neither

Neither can an accident be conveyed into the womb without the ſubject in which it is inherent: and therefore Iron touched without the Loadſtone, cannot draw Iron if the ſubſtance of the Loadſtone were not imparted to it. Hence we ſee, that as the ſubſtance of the Loadſtone in the Iron decayes, ſo the vertue of attraction decayes likewiſe. Again, when he ſaith, that the ſubſtance of the womb is like the conſtitution of the brain, he ſpeaks very improperly; for neither is the ſubſtance of the one like the ſubſtance of the other; the one being white, ſpermatical and cold; the other red, ſanguineal and hot; nor can the ſubſtance of the one be like the conſtitution of the other, theſe being indifferent predicaments, between which there is no ſimilitude, nor is the conſtitution of the one like unto the conſtitution of the other, as being of different temperaments, and having different uſes; and ſuppoſe they were either of the ſame ſubſtance, or conſtitution, it will not follow, that therefore they muſt have the ſame function: The ſtomach and guts have the ſame ſubſtance and conſtitution, ſo hath the brain and pith in the back bone: yet they have not the ſame functions. Again, when he ſaith, [that what the fantaſm or appetite is in the brain, the ſame or its analogy is excited in the womb, for the functions of both are called conceptions.] He ſpeaks more improperly then before; for he ſeems to make the fantaſm and appetite one thing, and to be both reſident in the brain, whereas the appetite is the inclination of the will, and hath its reſidence in the heart; the fantaſm is the imaginary, or fictitious object of the fantaſie, which this internal ſenſe reſiding in the brains repreſents to it ſelf; neither of theſe is excited in the womb, nor any thing like it; for the womb is neither the ſeat of the fantaſie, nor hath it fit organs for it; nor is it the ſeat of appetite, except by this word he underſtands an inclination to conception or generation: neither again is this a valid reaſon, that becauſe the functions of the womb and brain are called conceptions, therefore they are the ſame; for the conception of the womb is far different from that of the brain, neither do they agree, but equivocally, and in name onely; ſo this word conception is aſcribed to the action of underſtanding. Laſtly, though we can produce upon ſtone, or timber, or ſuch like matter, ſome ſhape or form like that Idea in our brain, yet it will not follow that the ſpecies of the father in the womb can produce the like brood; for I deny that the ſpecies or idea of the father is in the womb, but in the brain; this (not that) being the proper ſeat of the fan-

taſie,

taſie, which receiveth the ſpecies from the common ſenſe, and the imagination doth not alwayes work upon the ſeed, or embryo, nor doeth it produce any form, it onely worketh ſometimes and produceth but the accidental form; whereas ordinarily both the eſſential and accidental forms are produced by the formative power of the ſeed, or rather by the ſoul it ſelf, which fabricates its own manſion, which ſoul lay potentially in the ſeed, and is excited by the heat, or rather innate property of the matrix. To conclude, it is as great abſurdity to affirm that the female can be made pregnant, by conceiving a general immateral idea, as it was by ſome of the ancients to think, that the Spaniſh Mares could, as *Ariſtotle* ſpeaks, ἐξανεμοῦσθαι, conceive or be made pregnant by the Weſtern wind, and as the Poets ſaith;

Ore omnes verſæ, in Zephyrum, *ſtant rupibus altis,*
Exceptantq; leves auras, & ſæpe ſine ullis
Conjugiis vento gravidæ, mirabile dictu.

The like fabulous impregnations we read of in Ravens by the north winde, and in Partrages by bare imagination.

CHAP. IV.

1. *My Lord* Bacon's *opinion confuted concerning the French diſeaſe.* 2. *Concerning the expulſion of pellets out of guns.* 3. *Of the wax candle burning in ſpirit of wine.* 4. *Of the parts moſt nutritive in animals.* 5. *Of the ſpirits in cold bodies.* 6. *Of air, fire, water, oyl, whiteneſs, the hands and feet.* 7. *Of ſouls and ſpirits.* 8. *Of viſible objects and hearing.* 9. *Of ſounds and muſick.* 10. *Of ſinging birds, deſcending ſpecies, light.* 11. *Ingrate objects, and deafneſs, with other paſſages.*

HAving lighted lately upon two books, the one of Doctor *Harvie*'s *De generatione animalium*, wherein he proves that all animals have their original from eggs; which if true, then that is no fiction of the Poets, concerning *Leda*'s two eggs, out of which were procreated *Pollux* and *Helena*, *Caſtor* and *Clytemneſtra*; but I conceive the Doctor in this, ſpeaks rather tropically then properly; for *ſimile non eſt idem*, and what may in ſome ſort reſemble an egge, is not an egge: however, his book is full of excellent learning and obſervation; yet I have been bold in ſome things to diſſent from him, as may be ſeen in the former

Chapter

Chapter. The other book I lately viewed is, my Lord *Bacon*'s Natural Hiſtory, a Piece fraughted with much variety of elegant learning, but yet wherein are divers paſſages that deſerve animadverſion; I never had leaſure to run over the book till now, though I had ſeen it before, and now my diſtractions are ſuch, that I cannot exactly examine it, but onely (*ut canis è nilo*) here and there touch a little. Firſt then, I finde him miſtaken in thinking that the French-pox is begot by eating of mans fleſh: *Cent.*1. *Sect.*26. His reaſons are, *A ſtory of mans fleſh barrelled up like tunny, & eat at the ſiege of* Naples; *the other is, becauſe the Canibals who feed on mans fleſh are ſubject to that diſeaſe.* 3. *Becauſe the blood or fat of mans fleſh is mixed with poyſons: And laſtly, becauſe Witches feed on mans fleſh to aid their imaginations with high and foul vapors. Anſw.* Theſe reaſons are of ſmall validity. For 1. it was not the eating of mans fleſh at the ſiege of *Naples* that brought this diſeaſe into *Europe*, but it was procured by ſome of *Columbus* his Company, who had carnal commerce with foul Indian women, which with the pox they brought along with them. 2. Mans fleſh of all other animals is counted the moſt temperate, therefore cannot produce ſuch a venomous diſtemper ſo repugnant to mans body. 3. This is a peculiar diſeaſe of the Indians, both Eaſt and Weſt; for divers Countries have their divers maladies. 4. Neither can this, or any diſeaſe be counted new in reſpect of their ſubjects, original cauſes, or ſeminaries, for this diſeaſe is as old as mans fleſh, though in this part of the world it did not break out ſo generally as of late; and who knows but that the ancients had it, but under another name, being a kind of Leproſie. 5. The Canibals among the Indians are not more ſubject to this diſeaſe then others, who never taſted of mans fleſh; for in all ages there have been men eaters, yet not tainted mith this malady, and millions of latter years among us, who are infected with this poyſon, and yet never eat of mans fleſh. 6. It is againſt reaſon to imagine, that the fleſh of a man ſhould rather breed this diſeaſe, then of an ox or a ſheep, ſeeing mans fleſh is ſooner convertible into nutriment, then of any other animal, becauſe of the greater ſimpathy and ſpecifical unity. 7. Though ignorant Indians do mix mans blood or fat with poyſon, it will not therefore follow, that theſe are poyſonable; no more then wine can be called poyſon, becauſe poyſonable materials may be mixed with it: ſo we mix ſugar and butter with rats bane, which we know have no venemous quality in them. 8. Witches, who are ſilly fools,

fools, may eat mans fleſh, hoping thereby to aid their imaginations, but there is no ſuch vetue in mans fleſh as they conceive; ſo they uſe many ſpels, charms, and canting words, in which there is no more vertue then in a pibble ſtone, or a piece of rotten wood. 9. Mans fleſh can afford no foul vapors, except it befoul it ſelf, and putrified, and ſo indeed it may breed loathſome diſeaſes, as all other corrupt and putrified meats do; which is done as it is corrupted, not as it is mans fleſh; neither can it afford high vapors, except it were full of ſpirits, which cannot be in a piece of dead fleſh; he that will have high vapors muſt drink ſack, not eat mans fleſh; the blood of the vine, not of the vein can breed high vapors. Indeed the drinking of mans blood, and eating of his fleſh, may inure a man to cruelty, which *Catelin* knew by cauſing his aſſociates to drink humane blood; hence the Judaical law forbids eating of blood at all, ſhewing us hereby, how much God abhors cruelty, or that which may induce a man to it.

II. His Lordſhip calls it, *A crude and ignorant ſpeculation, to make the dilatation of the fire, the cauſe of the expulſion of the pellet out of the Gun; but he will have the cauſe to be the crude and windy ſpirits of nitre, dilated by heat, which bloweth abroad the flame, as an inward bellows.* But I would know what difference there is between dilatation, and between the flame and ſpirit of the nitre. He affirms dilatation to be the cauſe of this expulſion, therefore his exception againſt the former opinion was needleſs; and whereas he grants the flame to be the immediate expeller of the pellet, he unawares affirms what he rejects: neither can I ſee any difference between the flame of the nitre, and the ſpirit of the nitre inflamed, onely he was pleaſed to make ſhew of a new reaſon, by altering ſomewhat the words of the former, whereas the ſenſe is one and the ſame, the ſpeculation then is not crude, but the ſpirit of his nitre is crude, which without the flame can do nothing.

3. From a wax candle burning in a porringer full of ſpirit of wine ſet on fire, he infers (*Cent.* 1. 31.) ſtrange concluſions. As 1. *That the flame of the candle becomes bigger and globular, and not in pyramis, and conſequently that the pyramis of the flame is accidental.* I anſwer, the flame of the candle becomes bigger and globular accidentally, becauſe the air about it is heated by the flame of the wire, therefore, as in all things like draws to like, ſo one flame dilates it ſelf to enjoy the other; as a drop of water will contract it ſelf upon a drie, but

dilate it ſelf upon a wet table. 2. He infers, *That the flame of it ſelf would be round, if it were not for the air that quencheth the ſides of it.* But I ſay that the air is ſo far from quenching, that it cheriſheth and maintaineth the flame, without which it would quickly vaniſh, and that the flame would not be round of it ſelf, if the air round about were not inflamed: for the ſame cauſe it rouls and turns, not of its own nature, but becauſe the ambient flame draws it. 3. He infers hence, *That the celeſtial bodies are true fires, for they are globular, and have rotation, and have the colour and ſplendor of flame*: Theſe are weak arguments that from common accidents prove ſpecifical identities; for if the ſtars be true fires, becauſe globular, then we may infer that water drops are fire, becauſe round, and that every thing which hath rotation is fire; and if that be fire which hath the colour of fire, or that a flame which hath the ſplendor of flame; we may ſay that rotten ſticks, and glow-worms, or cats eyes are fire or flames, and if ſtars be flames, becauſe in colour they are like to flames; let us ſay that the Heaven is water, for in colour it is like water.

IV. It ſeems (ſaith he, Cent. 1. 45.) *that the parts of living creatures, that lie more inwards, nouriſh more then the outward fleſh; except it be the brain, which the ſpirits prey too much upon, to leave it any great vertue of nouriſhment.* This is not ſo, for experience ſhews the contrary, that the outward fleſh of ſheep, and ſo of other animals nouriſh more then the heart, lungs, liver, kidney, and ſpleen: Therefore *Galen*, (*l. de cibis.*) reckoneth theſe amongſt his meats of bad juyce; and indeed this ſtands with reaſon, for that nouriſheth moſt which is eaſieſt of concoction, and ſofteſt, and moſt abounding in benign and nutritive juyce, but ſuch is the outward fleſh, not the heart, kidney, *&c.* which are harder and drier, and not ſo apt to be converted into blood: It is true the Romans made much of the gooſes liver, more to pleaſe their palate, then out of any good nutriment it offorded; ſo they preferred moſhromes and ſuch like traſh, to the beſt nutrive meates, as for the brains they are leſs nutritive then the fleſh, not becauſe the ſpirits prey upon them (for the animal ſpirits in the brain, do not prey more upon it, then the vital ſpirits do upon the heart, which notwithſtanding, his lordſhip acknowledgeth to be more nouriſhing then the outward fleſh, becauſe more inward) but becauſe the brain is leſs ſanguineal then the fleſh; for thoſe parts which they call ſpermatical, are leſs nutritive: what is more inward then the (*Spinalis medulla*) or pith in the back bone,

bone, on which the animal ſpirits do not prey, and yet it is little nutritive.

V. *The fift cauſe of cold* (ſaith he, Cent. 73.) *is a quick ſpirit incloſed in a cold body, as in nitre, in water colder then oyle, which hath a duller ſpirit, ſo ſnow is colder then water, becauſe it hath more ſpirit; ſo ſome inſects, which have the ſpirit of life, as ſnakes &c. are cold to the touch, ſo quick ſilver is the coldeſt of all mettals, becauſe fulleſt of ſpirits. Anſw.* No ſpirit can be the cauſe of cold, for all ſpirits in vigitable animals produce heat, and are produced of heat, therefore we finde that where there are moſt ſpirits, there is leaſt cold. 2. Nitre which is mentioned by the Ancients, is hot and not cold; and therefore both *Dioſcorides*, *Pliny*, and *Galen* adſcribe to it the qualities of heat, to cut, extennat, diſcuſs and purge groſs and cold humors; and if that nitre which we uſe at this day, be not the ſame, yet it is not much unlike, (as *Mathiolus* ſhews) as having divers qualities of the old nitre; beſides, it is a kinde of ſalt, and is begot of hot things, as pigeons dung, and the urins of animals, therefore *Brun. Seidelius* makes it hot. 3. I deny that water is colder then oyl, to the outward touching, for hot waters (as he ſaid before) are in this regard cold, and if oyl hath a duller ſpirit then water, how comes it to mount upward, and ſwim above the water: ſure this aſcendant motion cannot produce from the earthy and groſs ſubſtance, but from the quick ſpirits thereof; therefore we finde that water is cold, and oyl hot in operation, becauſe more full of ſpirits then water. 4. I deny that ſnow is colder then water, becauſe it hath more ſpirit; but becauſe it is more condenſed: for heat and cold are more active in a denſe and ſolid, then in a thin atternated ſubſtance; ſo ice is colder then water, and yet who will ſay that there is more ſpirits in the ice then in water; beſides, the ſnow is colder then the water, becauſe begot of colder winds, and in colder clymats. 5. I deny that inſects are cold to the touch, for having in them the ſpirit of life; becauſe they are colder when that ſpirit is gon, as we ſee in all dead bodies which are colder, then when they were alive; therefore death is called by the Poets (*frigida mors*) and (*gelidum frigus*) the ſpirit of life is that which is both begot of heat, and begets heat, and preſerveth it; that when that ſpirit leave us, heat alſo forſakes us (*caler oſſa relinquit*) ſaith the Poet; It is not therefore the ſpirit of life, but the temperament and conſtitution of the body of divers earthy and watriſh animals, which argue cold; and we ſee that for this cauſe womens bodies are colder

then mens, and ſome men of colder conſtitutions then others, becauſe they have fewer ſpirits, and more of earth and water in them. We know alſo how dull and ſtupid our hands are in cold froſts, till the ſpirits in them be quickned by heat. 6. I deny alſo that quickſilver is the coldeſt of metals, becauſe fulleſt of ſpirits: for it is much doubted whether Mercury be cold at all; for agility proceeds from heat, not from cold, and ſuch a quality became the meſſenger of *Jupiter*, by whom all things receive life and vigour. Indeed Mercury may be called the Monſter of Nature; for ſometimes it refrigerats, ſometimes it califieth; it cures ſometimes cold, ſometimes hot diſeaſes; take it hot, it produceth cold; take it cold, it produceth hot effects: and it hath this quality of heat, that nothing is more penetrating then it is. *Chriſtopher Encelius* (*de re metalica*) makes it hot and moiſt in the fourth degree. *Quercitan* in his anſwer to *Aubert*, makes it rather aerial then aquiall; & we know that heat is one of the qualities of air. *Renodæus* (*in Pharmac.*) makes it both hot and cold. *Keckerman* (*in Siſt. Phy.*) ſayth, That it is hot, as it is full of ſpirits, but cold as theſe ſpirits are congealed. *Crocius* (*in Baſ. Cly.*) preſcribes it in defluxions of the head, and in hydropſies, which ſhews it is hot. And *Poterius* (*in Pharm. Spagir.*) tells us, That by reaſon of its different operations, no man can tell whether heat or cold be moſt predominant; but it is certain, ſaith he, that it is both: for is known by our ſenſes that it is cold, it is known by its effects and operations that it is hot: for it cuts, attenuates, diſſolves and purges, which are the effects of heat, and ſo his Lordſhip doth acknowledge in the next following leaf, *That heat doth attennate, and by atenuation, ſendeth forth the ſpirit.*

In his following diſcourſes he hath phraſes not to be tolerated in Phyloſophy, as when he ſaith (*Cent.* 1. 80.) That *tangible bodies have an antipathy with air.* Belike then the air is no tangible body; but experience ſhews the contrary, that air is tangible both actively and paſſively; our bodies are ſenſible enough of this tangibility, both in hot and cold weather. Again, if by tangible bodies he mean groſſe and denſe bodies, how can air have an antipathy with them, ſeeing air is one of the ingredients of which all mixed bodies are compounded? can it be contrary or antipatheticall to it ſelfe? He ſaith (*Sect.* 91.) That *paper or wood oyled, laſt long moiſt, but wet with water dry or putrifie ſooner, the cauſe is, for that air medleth little with the moiſture of oyle.* *Anſw.* He ſhould have told us the cauſe of this cauſe; for why doth not air medle with oyle as well as with

with water? The reaſon is, becauſe oyle is a more tenacious and denſe ſubſtance then water, and therefore reſiſteth the heat of the air longer, and cannot be ſo ſoon evaporated; and indeed it is not the air, but the heat in the air that works both on water and oile; for the cold air drieth up neither, it may well harden them. Take then two papers, the one moyſtned with water, the other with oyle, and hold them near the fire, we ſhall ſee the one dried up long before the other, ſo that his ſaying is erroneous when he inferreth (*Sect.*91.) That *fire worketh upon oyle as air upon water.* For indeed the air doth not work upon water, but heat in the air or fire; nor doth the fire work ſo ſoon upon the oyle as on the water, when they are at a diſtance. Again, he ſaith, T*hat white is a penurious colour, and where moiſture is ſcant.* *Anſw.* There are many things which want moiſture, and yet are black, as divers dry ſtones and coals; many bodies are not ſcant of moiſture, and yet are white, as Lilies, Milk, Snow. There is as much moiſture in a white Swan as in a black Raven. But when he ſaith (*Sect.*93) That *Birds and Horſes by age turn white, and the gray hairs of men come by the ſame reaſon*; he is miſtaken: for it is not want or ſcant of moiſture, but want of heat rather that is the cauſe of whiteneſſe: for old men abound more in watriſh moiſture then young men: and therefore we ſee that cold climats produce white complexions and skins, whereas they are black and ſwarthy in hot Countries. Snow is not bred in hot Summers, but in cold Winters; and hoarfroſt is ingendred in cold *Scithia*, not in hot *Ethiopia*. Again, he is miſtaken when he ſaith, (*Sect.*96,97.) That *the ſoals of the feet have great affinity with the head and mouth of the ſtomach; ſo the wriſts and hands have a ſympathy with the heart.* For there is no more affinity between theſe parts then any other; the feet have as great a ſympthy with the heart, and the wriſts with the head, as theſe with the heart and the other with the head. If there be any affinity between the head and the feet, it is by reaſon of the nerves; and ſo the ſame affinity may be to the hands. If there be any ſympathy between the heart and the wriſts, it is becauſe of the arteries, and ſo the ſympathy may be to the feet. It's true, that the heart is affected in Agues by things applied to the wriſts; not becauſe there is any ſympathy between the skin, muſcles, nerves and bones of the wriſts with the heart; but becauſe the arteries which have their originall from the heart, lie more open, and are more tangible there then in many other parts of the body; and yet in the temples, and divers other parts of

the body, you ſhall find the pulſe as well as in the wriſts, and things applied to theſe parts, will work as powerfully on the heart, as if applied to the wriſts.

His Lordſhip is angry, (*Sect.* 98.) *Becauſe we call the ſpirits of Plants and living Creatures* (*Soules*) *ſuch ſuperficiall ſpeculations* (ſaith he) *they have.* But he ſhould for the ſame reaſon be angry with the Scriptures, which ordinarily calls the ſpirits of beaſts, birds, and fiſhes (Souls.) He muſt alſo be angry with all wiſe Nomenclators, which have called living and ſenſitive creatures (Animals) becauſe they have (animal ſoules:) For *animal* is from *anima.*) Again, I would know, if this word likes him not, how he will call theſe ſpirits of animals? If he call them nothing but ſpirits, then he makes no difference between them and all other tangible bodies: For, according to his doctrine, there are ſpirits in ſtocks and ſtones, as well as in plants and animals; but I hope the ſpirits of theſe deſerve another name, then of the others; which indeed, according to the old and true Philoſophy, are meer qualities: which word alſo he rejects as Logicall, as though forſooth Logick, or Logicall terms were needleſſe, whereas no knowledge is more uſefull and neceſſary, as being the hand-maid to all Sciences, the want of which hath occaſioned multitudes of whimzicall conceits, and Chimera's in mens brains. Again, if he will not have theſe chiefe acts, agents, or movers in animals, to be called ſouls or ſpirits, but air, or vapour, or wind, he will find that all theſe three are called by the word (*Anima*) 1. Aire is *Anima* in the Prince of Poets, *Eclog.* 6.

Namq; canebat uti magnum per inane coacta
Semina, terrarumque, animæq; mariſq; fuiſſent.

2. Vapour is called (*anima*) too in the ſame Poet, (*Æn.* 8.) *Quantum ignes animæq; valent.* 3. The wind is (*anima*) alſo in *Horace*: *Impellunt animæ lintea Thraciæ*: and (*animus*) in the Poet, (*Æn.* 1.) *Mollitq; animos & temperat iras.* So then, call the Spirits of animals what you will, air, vapour, wind, or ſpirit, you will ſtill find (*anima* or *ſoul.*) is the term moſt proper for them, and that this is no ſuperficiall ſpeculation.

My Lord in his ſecond *Century* (*ſect.* 11.) *Makes pictures and ſhapes but ſecondary objects to the eye, but colours and order the things that are pleaſing to the ſight.* If he had ſaid, That colours are the chief objects of the eye, he had ſpoken more properly then to ſay, they are pleaſing to the eye; for ſome colours are very diſ-

pleaſin

pleasing to some eyes. As for order, that is not at all the object of the sight; for it is a relation, and relations incurre not into the senses. Again, he saith (*sect.* 114.) *That the sense of hearing striketh the spirits more immediatly then the other senses.* This is a very improper saying; for the senses are patients in receiving the species of their objects, not agents upon their objects. If there be any action of dijudication, that is the work of the phantasie rather then of the outward sense; and though I should yeeld that there were some actions of the eye, yet the sense of hearing is meerly passive, and therefore it is not the sense of hearing that striketh the spirits, but the species of the sound which is received by the spirit in the auditory nerve, and so conveyed into the phantasie: so it is not the smelling (as he saith) that worketh on the spirits, but the object that worketh on the sense of smelling. Again, when he saith, (*sect.* 117.) *That dores in fair weather give no sound*; he speakes by contraries: for if by fair weather he means dry weather, then dores give the greatest sound. I know not what kind of dores his were, but mine sound much in dry Summers, and but little in moist weather. And this stands with reason; for the humidity of the air must needs moisten the hinges, & consequently hinder their sound. Neither is it true which he saith of bullets, (*sect.* 120.) *That they in piercing through the air make no noyse*: For Souldiers will tell him the contrary, that many times they hear the whistling of the bullets over their heads. So darts and stones flung with violence in the air, make a sound, as the Poet sheweth:

Sonitum dat stridula cornus, & auras certa secat.

And his reason is no lesse infirm then his observation, to wit, That the extream violence or swiftnesse of the motion should hinder the sound, whereas nothing furthers the noyse so much as the swiftnesse of motion. Again, he is mistaken in our definition of sounds, when he makes us say, *That it is an elision of the air, which is a term of ignorance.* (*sect.* 124.) So it is indeed, but in him, not in the Philosophers, who doe not call sound an elision of the air, but the collision of two hard or solid bodies in the air. And no lesse is he mistaken when he saith, *That Sounds are generated where there is no air at all.* This he can never prove, for even in the water, and in the flame (wherein he saith sounds are generated) there is air; and if it were not for air, the sound should never be caried to our ear; and therefore the instrance he makes (*s.* 133.) *of knapping a pair of tongs within the water, which we can hear, and yet there is no air at all present,*

is to no purpoſe; for there is air preſent, both in the water, and beſides nothing but air from the ſuperficies of the water to our ear, by which *medium* the ſound is conveyed to us. He gives us a ſtrange reaſon (*Sect.* 143.) why we hear better in the night then in the day, *Becauſe in the day the air is more thin, and the ſound pierceth better, but when the air is more thick, the ſound ſpreadeth abroad leſſe.* Indeed by this reaſon we ſhould hear better by day; for the thinneſſe of the air, and the eaſie piercing of the ſound, are main helps to hearing, whereas the thickneſs of the air is a hinderance: Therefore *Hippocrates* in his Aphoriſmes obſerveth truly, That when the wind is Southerly, and the air thick, our hearing is heavy. We hear better when the wind is Northerly, and the air clear. It is not therefore the thickneſſe of the air, but the ſilence of the night which helpeth hearing, as the Poet ſaith,

Tunc ſilens omnis ager, pecudes, pictæq; volucres. Æn. 4.

And then it is when every ſound, though never ſo ſmall, affrights and excites him.

Tunc omnes terrent auræ, ſonus excitat omnis. Æn. 2.

In his third Century (*Sect.* 201) he tells us, That *though there be a wall between, we can hear the voyce one this ſide which is ſpoken on the other, not becauſe the ſound paſſeth through the wall, but arcketh over the wall.* But here he contradicteth himſelf in his former Century (*Sect.* 154) when he ſaith, *It is certain that the voyce doth paſſe thorow hard and ſolid bodies.* The voyce then may paſſe through a wall, and not over it: And how can it paſſe over that wall which is continually with the ſeeling or rooſe of the Houſe? For in a cloſe chamber I can heare the voyce of him that is in the next room, though there be a wall between us, and the room ſieled or rooſed. But he ſaith (*Sect.* 213.) That *the ſpirit of the hard body doth cooperate.* I would know what ſpirits there are in a ſtone or brick wall, or in a wall of mud to cooperate? If there be ſuch cooperating ſpirits, it will follow, That where are greateſt numbers of them, there will be moſt help, and the ſound better heard; but in a thick ſtone wall there are more ſpirits (becauſe more ſtones, every ſtone having his own ſpirit) then in a thin mud, woodden, or brick wall, and therefore the ſound muſt be better heard through a thick then a thin wall, there being ſo many pneumaticall cooperators, all helping to carry the ſound. This is Philoſophy that paſſeth all underſtanding. He ſaith (*Sect.* 235.) *It is manifeſt that between ſleeping and waking (when all the ſenſes are bound and ſuſpended) muſick is farre ſweeter then when one is fully waking.*

All

All the ſenſes are not bound when a man is between ſleeping and waking; but when a man is in dead ſleep, then are all the ſenſes bound: If then they are all bound, and likewiſe all are bound between ſleeping and waking, what difference will he make between the extream and the medium, between a dead ſleep, and that which is betwixt ſleeping and waking. Again, how can muſick be ſweet to him in whom all the ſenſes are bound up? Which way ſhall the muſick enter? Can he heare without hearing? Doubtleſſe the delight he hath in the Muſick doth ſhew all his ſenſes are not bound up. He ſhews, (238, 239.) That *Parrets, Pies, Jayes, Dawes and Ravens, are ſinging birds, and that this aptneſſe of ſinging is in their attention.* He ſhould have added Thruſhes and Stares to his ſinging birds; but it is not attention which is the cauſe of their ſinging; for beaſts and other birds may have as much attention, but its natural for birds to ſing, and their ſpeaking is but a kind of ſinging, for ſinging is the muſick of the throat, and ſpeaking the muſick of the tongue: it is eaſie for thoſe who exerciſe their throats and tongues in ſinging, to be brought to utter words by the ſame organs. *It may be* (ſaith he, 205) *the ſpirituall ſpecies of viſible things and ſounds, do move better downwards then upwards. Thoſe on the top of* Pauls *ſeem much leſſe then they are, but to men above, thoſe below ſeem nothing ſo much leſſened. So knots in gardens ſhew beſt from an upper window.* Theſe examples thwart his (*may be*) for if the ſpecies move better downward, how comes it that we ſee the object better from the top of *Pauls*, then from the ſtreet looking upward to the top? Doubtleſſe it is becauſe the viſible ſpecies of the things ſeen below, move better upward, as being more naturall both for the air which is a light body, and for the ſpecies which hath no gravity in it. Hence it is, that when wee ſtand below, we cannot ſo clearly diſcern the juſt magnitude of the men upon the top of *Pauls*, becauſe the ſpecies muſt come from that high object to our eye downward, which is not ſo natural. The ſame may be ſaid of the audible ſpecies; for ſounds are better heard by thoſe who are in high rooms, then by thoſe who are below: and ſo they that ſit in Church galleries, which are above the Pulpit, hear better then they who ſit below in the pues. He ſpeaks againſt experience when he ſaith, *There is a greater degree from the privative to the active, that is, from darkneſſe to light, then from leſſe light to more light.* For when the day breaks I cannot ſee to read in the firſt degree of light, which is from darkneſſe; but in the other degree which is from leſſe light to more, I can ſee to read, therefore this degree of

leſſe

leſſe light to more light, as far greater then the other, which was from the privative to the active.

He tells us (270) That *in viſibles there are not found objects ſo odious and ingrate to the ſenſe, as in audibles; thus the grating of a Saw ſets the teeth on edge.* That there are viſible objects more ingrate to the eye then audible to the ear, is plan by experience, in ſuch as have ſwounded and fallen ſuddenly dead at the ſight of ſome objects; ſome will ſweat and fall into ſtrange paſſions at the ſight of a Cat, others at other ſights. *Pompey's* wife fell into a ſwound when ſhe ſaw her husbands coat beſprinkled with blood, *Mark Antonies* ſpeech did not ſo forcibly work upon the *Romans* as the ſight of *Cæſars* bloody garment, to proſecute his murtherers. The phantaſie is much more affected by the eye then by the ear. As for the grating of a Saw, by which ſome mens teeth are ſet on edge, will not prove what he aimes at, but onely that the teeth are thus affected by reaſon of that nerve of the fifth conjugation, which ſendeth one branch to the ear, and another to the larinx and tongue; as likewiſe there is a cartaligenous paſſage between the ear and palat, by which the air received by the mouth, is communicated to the ear. Hence we ſtop our breath when we will hear attentively, and violent ſounds are evacuated by that paſſage which are received by the ear. But when he ſaith (276) That *there is no effect of deafneſſe found in Canoniers, and ſuch like*; he is again miſtaken: For it is known that divers have loſt their hearing by the noyſe of Cannous, and other violent ſounds. I knew one who grew deaf by being preſent at a Muſter where many Muſkets were diſcharged. Again, hee ſaith (277.) That *when a Skreen is put between the candle and the eye, the light is ſeen on the paper whereon one writeth, where the body of the flame is not ſeen.* But indeed neither the flame is ſeen, becauſe of the Skreen, nor the light on the paper, but the paper by the light: for light is not the object which we ſee, but by which we ſee; it actuates the medium, and makes the object viſible.

CHAP.

CHAP. V.

The Lord Bacons *opinions refuted. Of holding the breath when wee hearken. Of time. Of long life. Of making gold. Of ſtarres. Of oyl. Of indiſpoſition to motion. Of death, diſeaſes and putrifaction. Of ſtuttering. Of motion after the head is off. Of ſympathies and antipathies of the Vine and Colewort, the Fig-tree and Rew. Of white colour. Of the Oke bough in the earth. Of tranſmutation of ſpecies. Of Incubus. Of grain in cold Countries. Of determination and figures. Of accretion and alimentation. Of the period of life. Of ſugar, leaves, roots, ſnow, and putrifaction.*

WE have ſhewed out of Anatomy, why we hold our breath when we hearken attentively; but my Lord gives a reaſon no way ſatisfactory: *For* (ſaith he) *the cauſe is, for that in all expiration the motion is outward, and therefore rather driveth away the voyce then draweth it.* His Lordſhip ſayes well if we did hear by the mouth; but withall he ſhould have conſidered, that in breathing there is inſpiration as well as expiration, and we hold our breath in hearing attentively, that there may be no inſpiration as well as expiration. And indeed it muſt be a very weak voyce that our breath in expiration drives away. The true cauſe then as we have ſhewed, is the free paſſage of the air between the mouth and ear by means of the pipe or chanell we mentioned; therefore we ſtay our breath rather from inſpiration then expiration, leſt the drum in the ear be extended too much with air. He ſaith, *It conduceth to long life that mens actions be free and voluntary.* If this were ſo, the abſolute Monarchs of the world, whoſe words and commands are laws, and who have none to controll them, ſhould be longer lived then their ſubjects, who are forced to doe many things againſt their liking, though not againſt their will; for all mens actions otherwiſe are free and voluntary, becauſe they are men, but many times we ſee ſlaves live longer then Princes. He tells us, That *time and heat are fellows in many effects; for they both are airy and liquifie.* Time and heat cannot be fellows in effects, becauſe time is no agent, it doth not operate at all, quantities work not, though all things are produced in time; ſo hony and ſugar grow liquid, clay and roots grow dry in time, but not by time. Theſe effects are produced by the heat, drineſſe and moiſture of the aire, ſo that ſugar waxeth not more liquid by age, but by the air: for keep it twenty years, it will harden or ſoften according to the weather. So it is not time that hardeneth the crum of bread, but the heat of the air by drawing in ſenſibly

283 284 292 294

insensibly its humidity: and therfore it is rather Poetically spoken then Philosophically, to say that time hardeneth or softneth, produceth or destroyeth. This indeed is to put the syth into *Saturns* hand, and to make him the father and devourer
299 of his own children. He alledgeth one cause, *why women live longer then men, because they stir lesse.* But I say that men live longer then women, because they stir more: For by exercise the blood is warmed, the pores are opened, vapours are expelled, concoction is helped, the limbs and joynts are strengthened, the naturall heat is excited, the spirits and humours are refined. All ages shew us, that no women have ever reached to the age of some men; and it stands with reason that men should be longer lived, because they abound more in naturall heat, which is the cause why the Northern people are longer lived then the Southern. And I have observed, that in the Northern parts women are more given to exercise then in the countries farther South; and therefore are longer lived there
344 then here. And my Lord himselfe acknowledgeth, That *exercise hindreth putrifaction, and rest furthers it.* Therefore it follows, that men who exercise live longest, because they are furthest from putrifaction.

326. He *judgeth the work of making gold possible.* So have all they who have made shipwrack of their estates upon that stone, which hath proved no lesse dangerous then the rocks of *Malea.* It is not enough to judge the possibility, but it must be proved either by reason or experience, neither of which hath been yet done. For that factitious, or rather fictitious gold the Chymists brag of, is as far from true gold, as a painted fire is from a reall; for neither can it endure the fire, nor comfort the heart, nor hath it any of the qualities or essentiall properties of true gold. I am of *Scaligers* opinion, that it is as easie to change a beast into a man, as to convert any other metall into gold, which were to introduce by Art a specificall form into the matter, which is the work of Nature alone. He saith,
354 *It is a vain opinion to think the starre is the denser part of his Orb.* This is spoken both Lordly and majesterially: but he had done well to tell us why this opinion is vain, and to have delivered an opinion void of vanity, which he doth not; but his bare word is not sufficient to make this a vain opinion, which the learned of so many Ages have approved, and stands so much with reason. I confesse we know but little of those quintessentiall natures; for we are, as the Poet saith,

Curvæ in terris animæ, & cœlestium inanes.

Yet

Yet of all opinions this is moſt conſonant to reaſon, that the ſtarre is homogeneall with its ſpheare, ſo that the ſtarre is the heaven contracted, and the heaven in which the ſtarre moveth, is the ſtarre dilated; for otherwiſe wee muſt make the heaven an heterogeneall body, and conſequently organicall, which will prove the vainer opinion of the two. He tells us, That *Oyl is almoſt nothing elſe but water digeſted.* I may ſay it is 359
any thing elſe rather then water, from which it is ſo averſe, that it will not be united or incorporated with it: and the effects are clean oppoſite, for water is cold, oyle hot in operation, water putrifieth, oyle reſiſteth putrifaction; water makes Iron ruſt, oyle keeps it from ruſting; water quencheth the fire, oyle kindles and feeds it; water is heavy, oyle light, for it vvill ſtill be uppermoſt; vvater is thin, oyle thick; water is quickly up by heat, and turned into vapours, ſo is not oyle; water is the food of plants, oyle of men; oyle is apt to be inflamed, ſo is not water: therefore oyle is rather air or fire then vvater digeſted.

He gives us a ſtrange cauſe of mans indiſpoſition to motion 381
when Southern winds blow. *The cauſe* (ſaith he) *is, that the humours do melt and wax fluid, and ſo flow into the parts.* How humours ſhould melt, I know not, except they were congealed like butter, wax, or ice: and where be the parts into which they flow, he tells us not: but indeed the true cauſe is, the giving (as we call it) or relaxation of the muſcles, nerves, and tendons by the warm and moiſt air which in dry and cold weather are more firm compacted and united; and therefore the apter for motion. *It is* (ſaith he) *commonly ſeen, that more* 382
are ſick in Summer, and more die in Winter. This is to me a Riddle; for if more die in Winter then in Summer, it muſt follow, That more are ſick in Winter then in Summer; for men uſually die not till they be ſick, and ſo he contradicts himſelfe. Much like to this is that ſaying of his, *Diſeaſes are bred chiefly by heat*; the contrary whereof is apparent, that multitudes of diſeaſes are bread by cold; neither can I yeeld to him in ſaying, *That it is a ſuperficiall ground, that heat and moiſture* 383
cauſe putrifaction, becauſe there have been great plagues in dry years. But by his Lordſhips leave, the plagues were not bred by the dryneſſe of the yeare, but by the precedent heat and moiſture of the Winter, or Spring, which break out upon the hot and dry Summer, or Autumne, and this hee acknowledgeth in his next Section, where he ſheweth, That *the cauſe of diſeaſes is* 384
falſly imputed to the conſtitution of the air at that time when they

break

break forth, whereas it proceeds from a precedent ſequence and ſeries of the ſeaſons of the year; and ſo when he ſaith, *That in* Barbary *their plagues break up in Summer when the weather is hot and dry*: If this be ſo, then it is no ſuperficial ground to ſay that heat and moyſture cauſe putrifaction, ſeeing it is reſiſted by hot and dry weather, and indeed it were abſurd to think otherways, ſeeing both experience and reaſon tells us, that heat and moyſture are the breeders of putrifaction, and that frigidity and ſiccity are its greateſt enemies; therefore in cold climats and ſeaſons putrifaction is not ſo frequent, as in hot Countries, and Summers; ſo he confeſſeth, *that the Country about* Cap Vorde *is peſtilent through moyſture*; neither are drie things ſo apt to putrifie as moiſt, ſo the fleſh putrifieth and not the bones; the apple or the pear will putrifie, when the ſeed within remains unputrified: whereas thoſe bodies which have little or no moyſture, reſiſt putrifaction both in themſeves and others, as Salt, Brimſtone, Myrrhe, Aloes, and ſuch like.

386 He makes *Refrigeration of the tongues the cauſe of ſtuttering* If this were ſo, then old men ſhould ſtutter more then young men; for old men are colder. But we know the contrary, that not the coldneſſe, but rather the over-heating of the tongue cauſeth ſtuttering, and this he acknowledgeth in the ſame Section, that *many ſtutterers are very cholerick men.* But choler is hot, then it ſeemes that both heat and cold is the cauſe of ſtuttering. But indeed the true cauſe in ſome is a bad habit or cuſtom contracted from their infancy, in others eagerneſſe of diſpoſition; for haſty and eager natures uſually ſtutter, and whilſt they make the more haſte, they uſe the leſſe ſpeed; in others again ſtuttering proceeds from ſome infirmity or impediment in the tendon, muſcles, or nerves of the tongue. As for drinking of wine moderatly, which he ſaith, *will cauſe men ſtut leſſe*, is a thing I could never yet obſerve in thoſe ſtutterers I have bin acquainted with. He ſaith, That *men and beaſts move little after their heads are off, but in birds the motion remains longer, becauſe the ſpirit are chiefly in the head & brain, which in men & beaſts are large, but birds have ſmal heads, therfore the ſpirits are more diſperſed in the ſinewes.* That the ſpirits are chiefly in the head & brain, I deny; for the vital ſpirits are chiefly in the heart. And if the ſpirits be chiefly in the head and brain, why doth the body ſeparated from the head, move more and longer time then the head? Again, though birds have leſſer heads then men and beaſts, yet they have heads proportioned to their bodies, and the ſpirits proportionably are as much in their heads, as in mens or beaſts heads.

More-

Moreover, though ſome men and beaſts move little after the head is off, yet ſome move much: for I ſaw one beheaded, whoſe body after it was laid in the coffin, and carried a pretty way from the place of execution, with a violent fit of motion, was like to beat the coffin out of the hands of the bearers; therefore the true cauſes of this difference are theſe, as I conceive, 1. The ſpirits of birds are more aeriall and fervent then of men and beaſts, and in ſome more, in ſome leſſe; therefore the body of a Cock beheaded will flutter more then of a Gooſe, or Turkie; and ſo in beaſts, a Cat beheaded will move more violently, then of many others: for this reaſon ſome men move more then others. 2. The capacity of the veſſels may be the cauſe of this differance; for in men and beaſts the veins, arteries, and nerves, wherein the ſpirits and blood are contained, be larger then in birds, and therefore in them is a more ſudden eruption of the blood & ſpirits, and conſequently a ſhorter motion then in birds. 3. The weight of the bodies in men and beaſts farre exceed the weight of birds bodies, and therefore are not ſo apt to be moved.

His Lordſhip is pleaſed to call *The opinions of ſympathies and antipathies ignorant and idle conceits, and a forſaking of the true indications of cauſes, Felix qui potuit rerum cognoſere cauſas*, God will have us in ſome things, rather admire his wiſdom, then know his ſecrets; and becauſe we cannot attain the true reaſon of many things, we are to ſubmit our judgments to a reverend admiration of his goodneſs: who can give the reaſon of that ſympathy between the loadſtone and the iron? Between the ſame ſtone and the pole? We ſee there is a ſympathy between ſome ſimples and ſome humors, and between ſome parts of our bodies and ſome drugs. What other reaſon properly can be given, why Faltick draws choler, Agaric fleghm, Epithymum melancholy? Why Selenites, as *Fernelius* obſerveth, being applied to the skin, ſtayeth bleeding? Why ſhould Cantharides work onely on the bladder? Why doeth Hemlock and Henbane poyſon men, which nouriſh birds? How do cats come to the knowledge of Nip, and dogs of graſſe? who taught the Chicken to fear the Kite, or the Lamb the Wolfe? And why have ſome men ſtrong Antipathies with ſome meats? Why are ſome ſounds, ſome ſmels, ſome ſights grateful to us, ſome again odious? If there be no ſympathies and antipathies why are water and fire ſo averſe to each other? The Vine will not proſper if the Colewort grow near it, he gives a reaſon for this, *Becauſe the Colewort draweth the fatteſt juyce of the earth, and* 479

where

where two plants draw the ſame juyce their neighbourhood hurteth. This reaſon may be as well rejected as admitted; for other plants that are ſet neare and among Cole-worts, fare not the worſe for their vicinity, except it be Rue: and not onely doth this Antipathy laſt between the Vine and Colewort when they are alive, but when they are dead, and ſeparated from the earth: for they write that Coleworts hinder inebriation, and ſuffer not the wine to fume into the head; and why is not the vine as ſtrong to draw its nouriſhment from the earth as the Colewort, ſeeing it hath more ſpirits, and extends it ſelfe to a greater circuit and height? But when he ſaith, That *Rue being ſet by a Figtree, becometh ſtronger, becauſe the one draweth juice fit to refuſt ſweet, the other bitter.* I would know how one and the ſame piece of earth can afford ſweet juyce to the one, & bitter to the other at the ſame time: and how the fetide juice of the earth goeth into the Garlick, and the odorate into the Roſe when they grow together. Sure theſe are whimzies, for no piece of earth can have ſo many contrary qualities at the ſame time, nor can there be ſeverall juyces in one bud as he ſaith afterward; neither is the earth any thing elſe but the common matrix of the plants, affording them moiſture and nouriſhment, which my Lord acknowledgeth proceeds rather from the water then from the earth, when he ſaith, That *white Satyrion bean flowers, &c. are very ſuccubent, and need to be ſcanted in their nouriſhment*; he contradicts his former aſſertion when he ſaid, That *white was a penurious colour, and where moiſture is ſcant*: And yet he ſaith, That *white plumbs are the worſt, becauſe they are over-watry*: So it ſeems that white is both a penurious and a ſuper-plentifull colour, where moiſture is ſcant, and yet over-watry.

507 Sect. 93. 509

The opinion that an Oke bough put into the earth, will put forth wild Vines, is rejected by him, upon this ground, *It is not the Oke* (ſaith hee) *that turneth into a Vine; but the Oke bough putrifying, qualifieth the earth to put forth a vine of it ſelfe.* If the earth could put forth a vine of it ſelfe, what need it to be qualified by the putrified Oke bough? If it be of the putrified Oke bough (as doubtleſſe it is) that the vine is generated, then the earth doth not of it ſelfe ſend forth the vine. It is naturall for one thing to be generated out of the corruption of another; but for plants to be generated of the earth alone, without either ſeed, boughes, or ſome putrified materials of other things, were miraculous. He ſaith, That *tranſmutation of ſpecies is in the vulgar Philoſophy pronounced impoſſible;*

522 525

but

but this opinion is to be rejected. What he means by vulgar Philoſophy, I know not, but this I know, that the Philoſophy: which is vulgarly received by all learned and wiſe men, hold the tranſmutation of ſpecies impoſſible: not to God, who could transform *Lots* wife into ſalt, *Nebuchadnezzar* into a beaſt, waters into blood, a rod into a ſerpent, and water into wine, but to Art or Nature which cannot transform ſpecies, whether we underſtand the word in the extent and univerſality, or as it may ſignifie the individuall nature under ſuch a ſpecies: For every individual conſiſts of a matter and a forme, the whole compoſition cannot be transformed into another compoſition, nor the form to another ſpecificall form, nor the matter into another matter: not the firſt; for generation is not the changing of one compoſition into another, but an introduction of a new form into the matter: not the ſecond, for one form alwayes periſheth by corruption upon the introduction of another by generation: not the third; for the matter which is the common ſubject of all mutations, muſt be alwayes the ſame in ſubſtance, though it receive ſome alterations in qualities. Tranſmutation then of ſpecies is impoſſible to Nature, not to Chymiſts, who think to transform ſilver into gold: nor to the Roman Church, which holds a tranſubſtantiation of bread into Chriſts body: not unto Poets, who ſing of ſo many metamorphoſes and transformations of men into beaſts: nor of thoſe who think Witches can transform themſelves into Cats, Hares, and other creatures. He tells us, That *Muſhroms cauſe the accident which we call Incubus, or the Mare in the ſtomack.* If this were true, in *Italy* and *Africa*, where theſe are ordinarily eaten, this diſeaſe would reign moſt: but we find that the Northern Countries are more ſubject to the Incubus then the Southern. Many then eat Muſhroms who never were troubled with this diſeaſe, many are troubled with it who never eat them. But indeed the Incubus, or Mare, is no diſeaſe of the ſtomack, as he ſaith, but of the Diaphragma and lungs, which being oppreſſed by a thick flegme or melancholy, ſend up groſs vapours into the throat, by which ſpeech is hindred, and into the brain by which the imagination is diſturbed.

It is reported (ſaith he) *that grain out of the hotter Countries* 573
tranſlated into the colder, will be more forward then the ordinary grain of the cold Country. This is known to be untrue by divers grains tranſplanted hither into this cold climat, and by the grains tranſlated hence into the *Orcades*, and other cold parts. Again, he ſaith, That *plants are all figurate and determinate, which*

inanimat bodies are not] if this be ſo, then inanimat bodies are infinit, for certainly vvhatſoever is finit, hath its termination; and figure is nothing elſe but the diſpoſition of terminations; even water is figurat, becauſe it is ſinit, though it aſſumeth the figure of the continent body in vvhich it is. To ſay then that a ſtone is finit, and yet not figurat nor determinat, is a plain contradiction; a dead carcaſs is an inanimat body, & yet retains the ſame figure & termination, vvhich it had vvhilſt it vvas ani-
600 mat. In this ſame Section he tels us [*that plants do nouriſh, inanimat bodys do not, they have an accretion, but nó alimentation*] but how any thing can have an accretion vvithout alimentation is to me a ridle: I ſpeak of proper and Phyſicall accretion, which is an extenſion of all the parts by an internall principle or ſoule converting the aliment into the ſubſtance of the body nouriſhed. For that accretion of ſtones, and other inanimate things, is an appoſition of externall matter, not an extenſion of the parts by an internall agent, converting the nutriment into the thing nouriſhed. And how can ſtones, or ſuch hard bodies have extenſion, whereas they want humidity, which is the cauſe of extenſion. Beſides, accretion is a ſupply of deperdition; for where there is diminution of parts, by means of the heat exhauſting the radicall moiſture, there muſt be reſtauration by nutriment, and conſequently accretion. Therefore there maybe an outward agglutination or aggregation of ſtones without alimentation; but an accretion properly ſo called, there cannot be. Laſtly, he tells us in the ſame Section, That
602 *Plants have a period of life, vvhich inanimate bodies have not.* If inanimate bodies haae a life, and no period, then they are immortall like the Angels, and ſo the ſtones we tread on in the dirty ſtreets, are in better condition then the great Monarcks of the world. Again, if plants have a period of life, they have life, and conquently are living creature; and yet ſhortly after my Lord diſtinguiſheth them from living creatures in divers reſpects,

607 [*Sugar* (ſaith he) *to the Ancients was ſcarce known, and little uſed*] Sugar was both known to, and uſed by the Ancients; for that which they called *mel arundineum*, hony of the cane was much uſed in Phyſick: they called it alſo *Indian* ſalt, becauſe it was like ſalt in colour and conſiſtence, when it was harden'd by the Sun: the other kinde of Sugar the Ancients knew and uſed as well as wee; only they made it by preſſing, we by boyling of the canes, which kinde of boyling they uſed not as we do, becauſe they ſweetned their water by ſteeping the canes in them, and that was their drink: of this drink *Lucan* (*lib.*3.)

ſpeaks,

ſpeaks, *Quiq; bibunt tenerâ dulces ab arundine ſuccos.* And that they uſed ſometimes to boil the Sugar canes, is plain by *Strabo* (*lib.*35.)& likewiſe by *Statius* (*l.*1.*Syl.*) *Et quas præcoquit eboiſa cannas.* [*Seeds and Roots* (ſaith he) *are chiefly for nouriſhment, but leaves give no nouriſhment at all, or very little*] this is not ſo, for the leaves of cabbages, coleworts, lettice, and ſuch like, give the nouriſhment, and not the roots; there is more nouriſhment in the leaves of one cabbage, then in a hundred cabbage roots. He gives us a bad definition of ſnow, when he calls it [*the froth of the cloudy waters*] froth is aëreal, ſnow is watriſh, froth is hot, ſnow cold, froth is light, ſnow heavy, becauſe more terreſtrial; indeed in colour ſnow is like froth, hence *Scaliger* ſaith, that ſnow is almoſt froth. Poetical Phyloſophie diſcriminates froth from ſnow, in making *Venus* the daughter of the one, not of the other, ſnow then is not the froth of cloudie waters, though *Pliny* ſo calls it; but it is the thin and rarified vapours of the watriſh cloudes, united into thoſe white flakes we ſee, by cold; ſnow then is not begot immediately of water, as froth is, but of cold and thin vapours: Why he ſhould call [*putrifaction the ſubtileſt of all motions*] I cannot conceive, for what more ſubtilty is there in putrifaction that is a kinde of corruption, then in generation, the one conſiſting in the deperdation of the old form, the other in the acquiſition of a new form; neither doth he ſpeak Philoſophically, vvhen he calls it a motion, for indeed putrifaction is a mutation, and no motion, becauſe both the *termini à quo* and *ad quem*, are not poſitive, as they are in all motions. 631 663 692

CHAP. VI.

The Lord Bacons *opinions confuted concerning Snow, Ephemera, gravitie, the ſperme of Drunkards, putrifaction, teeth, bones and nails, thick and thin mediums,* Nilus, *hot Iron, brein, ſuddon darkneſs, drie and moiſt bodies, fiſh, cornes, hunger, liquifaction, hardneſs, moiſture, accidents, light, right ſide, ſpungy bodies, ſtone-walls, imagination, the cramp, hedghog, mummy, ſalt,* Commenus *and others refuted concerning motion, qualities, colours, forms, the Epilogue.*

MY Lord thinks [*that there is in ſnow a ſecret warmth, becauſe the Ancients have obſerved worms bred in old ſnow*] but I am of another opinion (though *Scaliger* ſeems to favour my Lords tenet) 695

tenets) that neither the ſnovv is vvarm, nor do theſe vvorms breed in ſnovv; our ſenſes tell us there is no heat in ſnovv; and vvhere there is no heat, there can be no putrifaction nor generation; the vvorms then are bred in the ground under the ſnovv, but not of the ſnovv, vvhich is not vvarm, but keeps in the vvarmth of the earth, and defends it, as it vvere a mantle from the piercing air, therefore in great ſnovves, ſheep vvill live longer under the ſnow then above in the ſharp air. And whereas the worm dieth when it comes out of the ſnow, this proceedes not (as he ſaith) *from the exhaling of the worms ſpirits, which was ſhut in by the cold*, but rather from the chilling of that ſpirit which was kept in by heat: for whilſt it was under the ſnow, the worm was kept warm from the piercing air which
697 now kils it. He ſaith, That *the flies called Ephemera, live but a day, the cauſe is the exility of the ſpirits, or perhaps the abſence of the Sun.* But neither of theſe is the cauſe: not the exility of ſpirit; for we ſee that among men they that have weak and attenuated ſpirits, live longer then they who have more ſtrong, denſe, and more plenty of ſpirits, and ſo in other creatures, a Horſe, or Bull, are not ſo long lived as a Crow, or Raven, which have more exility of ſpirit. The cauſe therefore of ſhort and long life, is the goodneſſe or badneſſe of the craſis and temperament of the radical moiſture, and its due or undue proportion with the natural heat, the ſymarrie or aſſymatrie of the four humours, and firſt qualities, and the conformity of the organs. As for the Suns abſence, that cannot be a cauſe of ſhort life: For, 1. the Sun is never abſent in his vertue, efficacy, and influence. 2. Many creatures proſper beſt in ſhades, as plants. 3. In thoſe Northern parts where the body and light of the Sun is not ſeen in many moneths together, yet multitudes of creatures are generated and live there. 4. It ſeems that the *Ephemera* are hurt rather by the Suns preſence then abſence: for *Scaliger* writes (*Exer.* 194. 5.) That thoſe *Ephemera* flies which he had ſeen, were always to be ſeen in the evening, never at the Sun riſing, and one of them which he had caught, lived all night, but died in the morning. The Suns preſence then rather then his abſence, is the cauſe of this ſhort life in the flye.

704 He ſaith, That *the motion of gravity is a meer motion of the matter, and hath no affinity with the form.* If it be ſo, what uſe is there of the form? the form of every thing is the nature thereof, and nature, as the Philoſopher tells us, is the principle and cauſe of motion: the matter is but the paſſive, the motion is the active principle of motion. When he tells us, That *over moiſture doth*

ſome-

ſomewhat extinguiſhthe heat, as hot water quencheth the fire: he ſpeaks not like a Philoſopher; for there is not Phyſicall action but where there is a contrariety: now there is no contrariety between moiſture and heat, but between moiſture and drineſs, heat and cold: therfore the humidity of the warm water works upon the ficcity of the fire, and not upon its heat. For if the one quality be taken away, the other will fail. Neither doth his Lordſhip ſpeak like a Philoſopher when he ſaith, That *the ſperm of drunken men is unfruitfull, becauſe over moyſtned. Lot*, who 723
in his drunkenneſs got both his daughters with child of boyes, can ſhew him the contrary, and ſo can the Comick when he ſaith, *Sine Cerere & libero friget Venus*. The Poets knew this vvhen they made *Bacchus* armour-bearer to *Venus*, and a continuall companion of the *Fauns* and *Satyrs*. And the Gentiles that ſtill offered vvine in the ſacrifices of *Venus*, as I have ſhewed elſewhere (*In Myſtagogo.*) Neither is the ſperm over-moiſtned, as he ſaith; for the drunkards vvine cannot get preſently into the ſperm to moiſten it, vvhich requireth time for elaboration in the ſpermaticall veſſels. Neither can I approve of his reaſon when he ſaith, That *Caterpillers breed upon Cabbages, becauſe they* 728
have fat leaves, and apt to putrifie. This contradicts his former aſſertion, That the viſcy ſubſtance of plants is moſt in the roots, and the vvatriſh in the leaves, vvhich is the cauſe that the root is more nutritive then the leaves. Neither doth fatneſſe make a thing apt to putrifie, but rather reſiſteth it: it is the watriſh moiſture that is moſt apt to putrifie, eſpecially being mixed with a groſſe and earthy ſubſtance.

He tells us, That *bones and teeth ſtand at a ſtay, as for nails they* 748
grow continually. This is not ſo: for nature hath prefixed certain limits of growth to every thing, which when it hath attained, reſts there: nails then if they be not pared, will grow to their prefixed length, and there ſtay; but if they be kept pared, they will grow, ſtill aiming at their juſt magnitude, which by paring them often, we hinder. Hence it is that they are ſtill growing, becauſe ſtill pared; ſo doe the hairs of our head and beards, and ſo do hedges and trees that are pruned.

He knoweth not *how the eye worketh when it is placed in the* 761
groſſer medium, and the object in the finer. This is eaſily known; for if ever he had been in a miſt, he ſhould have found that his eye being in the groſſer *medium*, could not well apprehend the object that was in the finer, though the object be celeſtiall luminaries, and ſo it is with thoſe that are in the water, they cannot ſee the object that is in the aire, ſo well as they who be-

ſng in the air, behold the object in the water, becauſe the diſtance of the thicker *medium* from the eye dilateth the object, which is contracted and made obſcure if the eye be in the thicker *medium*: for how can the ſpecies be received into the eye, if the *medium* that ſhould convey it, hindereth it? The
767 cauſe why it raineth not in Ægypt (ſaith he) is, *For that Nilus hath a longer race, and runneth ſwifter, for ſuch waters vapour not ſo much as ſtanding waters; or elſe there is a better concoction of that water; for waters concocted vapour not ſo much as raw. Beſides, the air there is thin and thirſty, and imbibeth the moiſture, and ſuffereth it not to remain in vapours.* Here are divers cauſes alledged, but none of them ſatisfactory: For, 1. there be rivers that have as long a race, and run ſwifter, which hinder not rain. 2. If ſtanding waters breed vapours, then *Nilus* ſhould, when it ſtands 40 dayes together over Ægypt. I deny that concocted waters breeds fewer vapours then raw waters: for water over the fire will never ceaſe to vapour, till it be all ſpent, and converted into vapours. 4. The air of Ægypt is not ſo thin and thirſty as under the Line, and yet there it raineth. 5. The true cauſe then why it raineth not in Ægypt is, becauſe God and Nature doe nothing in vain; but rain had been in vain and needleſſe in Ægypt, whereas *Nile* ſupplieth the effects thereof, therefore by the Poet *Nilus* is called, *Jupiter Ægyptius.*

My Lord ſpeaketh againſt manifeſt experience when he
774 writes, That *Iron red hot burneth and conſumeth not.* That was the priviledge onely of the fire-buſh which *Moſes* ſaw. We know that the fire by degrees waſteth the Iron, and Steel alſo, which is a harder metall. But he ſaith, That *the increaſing of the weight of the water will increaſe his power of bearing, as brine when it is ſalt enough will bear an egge.* In twenty gallons of water an egge will ſink as well as in one, ſo as the increaſing of the weight is no-thing, but it is the thickning of the water with ſalt that maketh it ſtrong to bear. So we ſee men in boats are better ſupported in Sea-water then in freſh. *How ſight* as hee
793 ſaith, *coming into ſudden darkneſs, ſhould induce an offer to ſhiver*, is a ſtrange Ænigma; for the ſight in darkneſſe can neither act nor ſuffer, as having no object nor viſive ſpecies. It is not the ſight then, but the imagination upon the ſudden change apprehending danger, that cauſeth the ſhivering. *Water* (he ſaith) *by*
800 *a kind of appetite, or thirſt, receiveth dry bodies, and ſo dry bodies drink in waters and liquors.* It were ſtrange that contraries ſhould have an appetite or thirſt to each other. It were againſt nature, *ſimile ſimili gaudet*, like draws to like, and contraries ſhun each other.

other. Hence it is, that vvater vvill not ſpread it ſelfe ſo ſoon on a dry board as on a wet: upon a dry board a drop of vvater vvill contract it ſelf into a globular form, and riſe into ſome height, rather then joyn it ſelfe to its enemy; whereas upon a vvet board it preſently ſpreads it ſelfe: So dry things will rather ſwim upon, then ſink in the vvater, except their vveight force them downward. He alſo contradicteth experience when he ſaith, That *Fiſh hating the dry will not approach the air till it* 825
grow moiſt.; For vve ſee that fiſh play moſt upon the top of the vvaters in hot and dry Summers, and in the hotteſt and drieſt time of the day, when the Sun is in his Meridian. So when he ſaith, That *Aches and Corns engrieve moſt towards rain or froſt.* 828
This is not as if they were ſenſible of future rain, but becauſe the extremity of heat and cold doe exaſperate theſe infirmities. For the ſame reaſon Moals vvork, and Fleas bite more eagerly. He tells, That *hunger is an emptineſſe.* But this is not ſo; 831
for there is ſometimes hunger without emptineſſe, and ſometimes emptineſſe without hunger. It is therefore not emptineſſe, but ἐπιθυμία θερμῶν καὶ ξηρῶν, as the Philoſopher tells us, a deſire or appetite of hot and dry things, cauſed by the corrugation and ſucking in the mouth of the ſtomach.

His Lordſhip is pleaſed to call the received opinion, *That* 835
putrifaction is cauſed by cold, or preternaturall heat, but nugation. But if cold be not the cauſe of putrifaction, how comes it that Apples and Cabbages doe rot in froſty vveather? And if peregrine heat be not the cauſe, how comes it that in hot and moiſt years and places, peſtilentiall Feavers, and other putrid diſeaſes doe reigne? Beſides, abundance of vermin; doubtleſſe theſe are procreated of putrifaction, and this of heat, except we will forfeit our ſenſes and reaſon; of which he being afraid, confeſſeth at laſt, that ſuch a heat tendeth to diſſolution. He will not have liquifaction to proceed from any of the foure prime qualities, that he calls an inutile ſpeculation, but from his own phantomes. *For bodies* (ſaith he) *that are more turgid of* 840
ſpirit, or that have their ſpirits more ſtraitly impriſoned as metals, or that hold them better pleaſed and content as butter, are liquifiable. How happy then are thoſe ſpirits which dwell in butter, where they have pleaſure and content, in compariſon of thoſe vvretched ſpirits vvhich are impriſoned in Irons and other merals, and yet how theſe ſpirits ſhould make the metall turgid, I know not. Surely theſe are but craſie fanſies, vvhereas it is apparent to all intelligible men, that theſe things are moſt liquifiable, which aboundeth moſt with congealed moiſture, whether it be aeriall

and oily, as in pitch, butter, wax, and greaſe; or watriſh alone, as in Ice; or of a middle nature between both; or peculiar, as the moiſture of metals. And to tell us, That *wood, clay, free-ſtone, &c. are not liquifiable, becauſe they are bodies jejune of ſpirits*, is ridiculous; for there are more ſpirits in vegitables then in metals: and it is plain, that clay and ſtones melt not, becauſe they want moyſture, which is in metals. So it is not *the dilatation of the ſpirits* (as he ſaith) *by heat, which cauſeth wax to melt at the fire*; but the rarefaction of the moyſture by heat, which was before contracted by the cold. For this cauſe dry wood is more fragile then green, ſtone then metall, and fictile earth then crude, becauſe there is no moiſture in the one comparable to the moiſture of the other.

844 He tels us, *that the hardnes of body is cauſed chiefly by the jejuneſs of the ſpirits*. Indeed this Philoſophy is ſomwhat jejun; for I would fain know whether there be not more ſpirits and leſs jejune in the hard bodies of Cloves, Nutmegs, and Cinnamon, then in the ſoft bodies of Wooll, Silk, and Cotton? According to his Philoſophy there is a greater quantity of Spirits in a pellet of butter, becauſe ſofter, then in a Nutmeg which is harder; he that beleeves this, let him when he is troubled with flatulencies in his ſtomack, uſe butter, and not hard ſpices. He ſaith, That

851 *Moiſture doth chiefly colour hair; but drineſs turneth them gray and white*. In his Philoſophy then gray and white are not colours,

873 nor indeed blacknes, which he ſaith afterwards, *is but a privative*, and conſequently hath no entity. *Ariſtotle* indeed ſometimes calls black a privation; but there he uſeth the words in a large ſenſe: for if it were properly privative, how could other colours be made of black and white, ſeeing of habits and priva-

853 tions nothing can be made. He ſaith, That *ſome fiſhes be greater then any beaſts, becauſe theſe have not their moiſture drawn by the air and ſun-beams. Alſo they reſt always in a manner, and are ſupported by the water*. If theſe be the reaſons of fiſhes greatneſs, then why are Smelts and other leſſer fiſhes, ſmaller then the beaſts? Or why are they not as big as Whales, ſeeing neither air nor ſun-beams draw away their moiſture, and are alſo ſupported by the water? The true cauſe then of the bigneſs of fiſhes above the beaſts, is the predominance of moiſture in them, which is eaſily extendible. And indeed it is a frivolous thing to give reaſons for the different magnitudes of the creatures, ſeeing Nature hath given to each creature a determinate magnitude and period of duration. And whereas he thinks, that fiſh doe reſt in a manner when they ſwim, becauſe they are ſupported

by

by the water; he may as well ſay, That beaſts and men reſt when they walk and run, becauſe ſupported by the earth: they that ſwim find there is no reſt, but labour and motion.

Before my Lord told us, That *by heat in putrifaction the ſpirits are emitted, ſuppreſſed, and ſuffocated*: But now he ſaith, That *the ſpirits in putrifaction gather heat.* How the ſpirits at the ſame time ſhould be deſtroyed by the heat, and yet gather heat, is ſo ſublime a fanſie, that no fanſie but his own can reach it. *Water* (ſaith he) *being contiguous with air cooleth it, but moyſtneth it not, except it vapour, becauſe heat & cold have a virtuall tranſaction without communication of ſubſtance, but moyſture not.* He takes it for granted, which no Philoſophy will grant him, to wit, that accidents can paſſe from one ſubject to another without their ſubſtance, which is to make accidents ſubſiſt by themſelves, and to be all one with the ſubſtance, which is repugnant to ſenſe and reaſon: therefore without vapours neither can the water moyſten nor cool the air. He ſaith, *Air is not without ſome ſecret degree of heat.* He needs make no ſecret of it, for it is manifeſt, that the air is hot and moiſt, as the fire is hot and dry; but for any ſecret degree of light in the air, I deny: For though (as he ſaith) Cats and Owles ſee in the night, this is not becauſe there is any degree of light in the air; for what light can there be in a dark dungeon where yet a Cat can ſee? The air is not a light body of it ſelf, being diaphanous; for the celeſtiall ſphears are not light, neither is there any luminous body in the dark Dungeon, except the Cats eyes, which afford light enough to the Cat to ſee his object. He gives us a reaſon why the limbs on the right ſide are ſtronger, *Becauſe motion is holpen from the liver.* How the liver ſhould help motion, is not known in Anatomy, ſeeing motion and its Organs are from the brain, not from the liver: He had better have ſaid that motion is holpen from the heart, and ſo might have inferred, that the left ſide limbs are ſtrongeſt. But indeed the true cauſe why the right ſide is ſtronger then the left, is, becauſe the right limbs are bigger: but why Nature made them bigger or ſtronger, no other reaſon can be given, then that the right ſide is hotter, becauſe there is the fountain of blood. He ſaith, That *all ſpongie bodies expell the air, and draw in liquor.* This is not ſo; for why ſhould ſuch a body expell the air and draw in liquor; but when the liquor enters into a ſpongie body the air gives place as a void penetration: therefore Sugar expels not the air to ſuck up the Wine, but the wine enters into the Sugar, and expels the air, ſo that the Sugar is a meet patient. He tells us,

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That

937 That *ſtone walls are not ſo wholſom as wood, or bricks.* This aſſertion ſtands neither with experience nor reaſon; for they who have lived with their predeceſſors within ſtone walls many hundreths of years, never found any unwholſomneſſe by the ſtones, and it is againſt reaſon, that dry ſtones, who as he phraſeth it, are jejune of ſpirits, ſhould afford any vapours, or unwholſom damps. It's true, that in moyſt weather there be ſome Sea-ſtones, or ſuch as are taken out of Rivers, will ſweat; but I have ſeen ſuch drops upon brick-walls. This proceeds neither from the ſtone nor brick, but from the air, which falling upon the hard ſtone, and being reſiſted for want of pores, from penetrating, ſtayeth there, and by the coldneſs of the ſtone turns to
954 water-drops, even upon Marble. *It is certain*, ſaith he, *that potions, incenſe, perfumes, an oyntments, do naturally work upon the imaginations.* The contrary rather is certain, to wit, that the imagination worketh upon theſe, not they upon it: for according to the ſtrength of imagination the phyſick works, and not according to the ſtrength of phyſick doth the imagination work. For ſometimes the ſmell or ſight of phyſick have wrought, not upon the imagination, but upon the body by the power of imagination, ſo that this is the prime cauſe why the phyſick worketh, which will not work at all in others whoſe imagination is weak and dull.

964 *The cramp* (ſaith he) *cometh of contraction of ſinews either by cold or drineſſe.* The cramp cometh by diſtention as well as by contraction, by heat and moiſtneſſe as well as by cold and drineſs. A Lute ſtring wil break as ſoon in moiſt weather when it ſwels, as in dry weather when it ſhrinks. And *Hippocrates* tells us, that the cramp proceeds as well from repletion as from inanition: for gluttony, drunkenneſſe, and ſuppreſſing of accuſtomed evacuations, procure the cramp as well as faſting, watching, bleeding, burning fevers. and vomiting, chiefly by *Hellebor*, which I can ſpeak to my grief: for I never knew what the cramp was, till I was let blood and purged with *Hellebor* by an unskilfull Phyſician. And indeed the cramp is not ſo much the affection of the ſinews, as of the muſcles; for it is the involuntary contraction of the muſcle to its originall or beginning, becauſe not the nerve but the muſcle, is the proper inſtrument of motion, which by the cramp is hurt; ſo that this infirmity hath different names from the different muſcles in which it is. If it be in the muſcles of the eye, it is called *Stratiſmus*; in the yard, *Satyriaſis*; in the muſcle of the jaw-bone, *Triſmus*; in the muſcles of the mouth, *Spaſmus Cynicus*, or the Dog-cramp. In the Epi-

lepſie

lepſie alſo, or falling ſickneſſe, there is a kind of cramp. And many times the cramp proceeds from flatulencies in the muſcles, which though they be the proper organs of convulſions, or cramps, yet the cauſe is many times in the nerves, which being contracted by the ſharpneſſe or fulneſſe of humors, or by malignant vapours, draw the muſcles with them.

Becauſe the Hedg-hog putteth forth many prickles, therfore he inferres, That *the juyce af a Hedg-hog muſt needs be harſh and dry*. 979 There is no neceſſity for this, becauſe the harſh & dry matter is expelled by nature into the prickles. The fleſh of ſome fiſhes, whoſe ſhells or skins are full of prickles, is neither harſh nor dry. The Roſe ſends forth many prickles, and yet it is both pleaſant, odoriferous, cooling and moiſt. So are the Reſpberries. He tells us, That *Mummy hath a great force in ſtanching of blood*. 980 But I wiſh he could tell us where we may find it: For the true *Mummy* which was found in the Tombes of the Ægyptian Kings, which were embalmed vvith divers pretious liquors and ſpices, are ſpent long agoe, ſo that the *Mummy* now in uſe is only the ſubſtance of dried Karkaſſes digged out of the ſands, being overwhelmed there, in which there is no more vertue to ſtanch blood, then in a ſtick. He ſaith, *All life hath a ſympathy with ſalt*. 982 In hogges I think its true; for as life is the ſalt of a living hogge, ſo ſalt is the life of a dead hogge: For both life and ſalt keep the body from putrifying: otherwiſe I know little or no ſympathy that ſalt hath with life; for it deſtroyeth the life of many creatures. But he is miſtaken vvhen he ſaith, *That ſalt draweth blood, becauſe being laid to a cut finger, healeth it*. For ſalt is laid to a cut finger not to draw the blood, vvhich cometh too faſt of it ſelfe vvithout drawing; but to repell the blood, and to ſtop its running. It heals them, not by drawing the blood, but by abſterſion, exſiccation, aſtriction and reſiſting putrifaction.

Thus I have curſorily run over my Lords new Philoſophy, vvhich he calls a *Wood*, and ſo it is indeed; for here a young Scholar may quickly loſe himſelfe, and ſhal encounter with many bryers and brambles. I find that Phyloſophy is like Wine, the older the better to the taſte; new Wine is pleaſant, and ſo are new conſcripts to the mind: but to the intelligent man oldeſt is wholſomeſt and leſſe flatulent. And indeed that which they call new Philoſophy, is nothing but the old in a new dreſſing, vvhich is neither ſo handſome nor ſo uſefull as the other. They have found out new terms, which are neither ſo proper nor ſignificant as the former. They have metamorphoſed

phoſed the elementary qualities both firſt and ſecond, into ſpirits,ſo that now this word, like a noſe of wax, ſerves them for all ſhapes. I find in my Lords book much droſs mingled with his gold; he doth wrong both himſelf and his reader, in undertaking to give the cauſes or reaſons of every thing: For Nature is pleaſed in thouſands of things, to ſport herſelfe with variety. Who can give the cauſe of ſo many different forms in beaſts, birds, and fiſhes; of ſo many different ſhapes and colours in herbs, trees, and plants; of ſo many different ſtreaks and ſpots in ſhels, ſtones,and other things. He that takes upon him to give reaſons of all theſe varieties, will take too much upon him. But as *Scaliger* ſaith, It is the part of true wiſdom not to be too wiſe.

Wheras *Ariſtotle* had with infinite pains and induſtry,and not without ſingular dexterity, reduced all entities into certain heads,and placed them in ten Claſſes,or Predicaments to avoid confuſion, and that we might with the more facility find out the true genus and difference of things, for our more eaſie defining, deſcribing,dividing of things, and methodicall arguing upon any ſubject. Which *Ariſtotelian* way hath been received and approved by all Univerſities, and the wiſe men ſince his time in all ages, as being the beſt, eaſieſt, moſt methodical, and moſt conſonant to Reaſon, of all the vvayes yet found out: Theſe new Philoſophers, as if they were wiſer then all the world beſides, have like fantaſtick travellers, left the old beaten and known path,to find out wayes unknown,crooked and unpaſſable,and have reduced his comely order into the old chaos,jumbling the Predicaments ſo together, that their Scholars can never find out the true genus of things. For example, they tell us,that the qualities,to wit,of heat, cold, &c. are ſpirits,conſequently ſubſtances; ſo ſomtimes again they will have theſe to be qualities, and ſometimetimes to be motions and actions.Thus *Proteus*-like they turn themſelves into all ſhapes, ſo that we know not in what predicament to put their heat, or what Genus to give it. *Comenius* in his reformed Phyſicks, gives us ſome wiſe reaſons to prove that heat is motion,becauſe forſooth *There is not with us a body that is perpetually hot.* Beſides that this is falſe, for our fire is perpetually hot, and never cold, water perpetually moiſt and never dry,the air perpetually light and never heavy, the earth perpetually heavy and never light; ſo it is ridiculous to think, that whatſoever is not either perpetually hot or cold,moiſt or dry, &c. muſt be motion: for by this reaſon all ſublunary entities muſt be motions, becauſe there

there is no other permanent quality except in a few. But let us examine the abſurdities of this conceit. 1. If heat, cold, and other qualities be motions, then they are all imperfect entities, for motion is ſuch, as being (in *fieri*, not in *facto*.) But this is untrue; for all qualities are perfect entities in their own kind. 2. Reſt is the perfection and end of motion; but it is not the end and perfection of heat and cold: for the coldneſſe of a ſtanding Lake is not more perfect becauſe it reſts, then of a river becauſe it moves. 3. Reſt is oppoſite to motion, cold is oppoſite to heat, how then can heat and cold be motions? 4. Motion is (*commune ſenſibile*) an object of divers ſenſes, for it is perceptible by the eye, by the ear in ſounds, and by the tact alſo; but heat and cold are onely perceptible to the tact. 5. Motion addeth weight to a heavy body; it is the motion of the Cutter that makes the Ax cut down the tree, whereas neither the heat nor coldneſſe of the Ax addeth any thing to the action of the Ax. 6. Motion begets heat, therefore they cannot be the ſame, except wee will make one and the ſame entity to work upon, and produce it ſelfe, to be both cauſe and effect, agent and patient to it ſelfe, which is an abſurd contradiction. 7. It is not motion but heat that attenuateth, penetrateth, openeth, ripeneth, diſſolveth, congregateth homogeneous things, & diſgregateth hererogeneous. Again, they reaſon thus (*Comen. Phyſ. c.* 4.) *that heat penetrates and diſtends, cold ſtoppeth & contracteth, therfore they are motions.* They may as well infer, that light is a motion, becauſe it penetrateth glaſſe, or that wine-vinegar, oyles, or any ſubſtance that penetrates, are motions, which are childiſh conceits. And no leſſe feeble is their third Argument, whereby they prove heat to be a motion, *Becauſe it waſteth and conſumeth even the hardeſt metals.* Heat preſerveth as well as waſteth. Is it a motion in both regards? Again, is there no difference between the agent and the action, the mover and the motion, the waſter and the waſting of a thing?

As in many other vain conceits they ſhew their weakneſſe, ſo likewiſe in this, when they call colours light, and ſay, (*Comen. c.*4) *That colours of themſelves have no entity, but from the light, becauſe they are not ſeen without the light.* Thus they confound (after their maner) the object (which) & the mean (by which) we ſee. We ſee colours, we ſee not the light, but we ſee by the light. This doctrine, if there bee no entity in colours, but what is given by the light, then in darkneſſe there muſt be non-entities; and ſo a Crow is not black, nor a Swan white, but when the Sun ſhines on them: blood then is not red within the

the veins, nor milk white within the breasts, till they be let out into the light. What can be more ridiculous then to think, that because the light gives visibility, therefore it gives entity to things. To a blind man all colours are non-entities, which to him that seeth them are entities at the same time; so at the same time colours are something and nothing. My Lord *Bacon* saith, That the colours of Gems are fine spirits, how then can they be be non-entities? And surely, if whatsoever we see not, be non-entities, we may conclude that substances are non-entities, for they are not visible: and if it be the light that giveth being to colours, it must needs follow, that black hairs turn gray in us, not from the constitution of our temperaments, but from the light: and so it is onely the light that makes some black, some red, some flaxen, and some gray haired. Again, they say, (c.4.) *Colour diffuseth it selfe through the air, as light doth, therefore it is light.* This is untrue; for colour doth not diffuse it self through the air as light doth: for the colour of a Rose is onely in the Rose, and not diffused in the air; they should rather say, That the smell of the Rose is diffused through the air, and that therefore the smell is light, or that heat and cold are lights, because they are diffused. Again, they say, (c.4.) *That the light produceth in the Rain-bow different colours.* What then? Will it follow that therefore the light produceth all colours? Wil they make no difference between reall and apparent or intentionall colours? The colour which is in a green glasse, is reall; but that which from the glasse is cast on the paper, is onely apparent. The colour of my face is reall, but not in the looking-glasse, there it is onely apparent. If light makes colours, why makes it not snow black, and coals white. Lastly, they tell us, (c.4.) *That specificall forms are made up of qualities.* If this be so, then things cannot differ specifically one from another: for what differs in qualities, differs onely accidentally; and so must a man differ from a horse: one man differs from another onely in qualities; but if he differ onely in qualities, then *Alexander* and his horse *Bucephalus* are specifically the same. But whence proceed these qualities which make the difference? not from the matter, for in this they differ not; not from themselves, for nothing can produce it self. It remains then, that they result from the substantiall form, from which all proper and specificall accidents have their dependence, both in entity and operation. And indeed to deny the substantiall form, is to deny the composition and generation of things; for in all compounded bodies there must be two parts at least to make up the composition, and

these

theſe can be none elſe but matter and form. For qualities are no parts, nor can they make a compoſition with the ſubſtance. And whereas the end of generation is the production of the form, there would be no generation at all, if qualities only were produced; alteration there may be, generation there can be none.

Thus I have (good Reader) given thee a taſt of our new Philoſophy, or rather old pſeudoſophy: for indeed theſe new opinions are but old obſolete and rejected errors, raked out again from under their aſhes, where they have lain buried many years. Here we ſee how queaſie ſtomacks are weary to eat continually of one diſh, though never ſo wholſome. I would not have any man ſo ſilly, as to think that I wrong thoſe whoſe opinions here I ventilate. I honour their perſons, memories and worths, though I oppoſe their dictates. The Traveller is not wronged, if when he goeth aſtray, he is told ſo, & the right way is ſhewed him. What hurt is it to tell our friend when he eateth too much raw fruit, that his health will be thereby indangered. If any man ſay, that I who points the way to others, am out of it my ſelfe; I will thankfully ſubmit my ſelf to him, that will ſet me right. I know, we are all pretenders to truth, but few can find her out, ſhe lieth ſo deep in the well: ſhe is indeed the daughter of *Jupiter*, as the Poet calls her, and θεῶν ὁμόπολις, a fellow-citizen with the Gods, and συνδίαιτομενη one which hath the honor to be their gueſt, & ſit at table with them, ſo that acceſſe to her is very full of difficulty; but this is my comfort, that in ſeeking her I follow the conduct of the moſt & wiſeſt Philoſophers, ſo that if I am out of the way, I am not alone; and better it is to go aſtray with the beſt then with the worſt, with company then alone. And if I cannot in this life find out that beautifull Lady, I will comfort my ſelf in the enjoyment of her picture, or of that which moſt reſembleth her; as that amorous Queen, who miſſing of the Father, was content to ſolace herſelf with the embracements of his youug Son.

Hæc gremio Aſcanium genitores imagine capta
Detinet.

F I N I S.

Good Reader, I met yeſternight with this learned Letter, which I have briefly anſwer'd, and have annexed to this Apendix, that thou mayſt know how offenſive Dr. Harvey's *opinion is to others as well as to my ſelf.*

Doctiſſime vir,

NISI ſumma tua eruditio aditum mihi patefacere videretur, non auderem te, cum quo nec familiaritas nec conſuetudo mihi unquam fuit compellari: ſed quod perſuaſum habeam doctiſſimos quoſq; maxime obvios plenoſq; humanitatis eſſe, hoc mihi hærenti animos dedit. Hâc igitur veniam à viro erudito(uti ſpero)impetratâ, par eſt ut paucis, quid ad hoc conſilium me compulit, exponam. Anno proximè elapſo, Exercitationes viri celeberrimi Dom. *Harvei, De Generatione Animalium*, in publicæ famæ comitium prodierunt. In quibus argutiſſimus Author, relictis medicorum placitis, qui ex maris & feminæ ſeminibus conceptũ fieri ſtatuunt; atq; etiam *Ariſtotelis* diſſidens, qui maris ſemen formam, ut agens conferre fœminam materiam aſſerit: novam generationis Sciographiam depingit. In qua nec maris ſemen, utquod uterum nequaquam ingreditur, nec fœminæ, quippe quæ ſemine caret; locũ ullum habere contendit: ſed fœminam

fœcundam fieri, poſt tactum in coitu ſperma. ticum, ſimili virtute, quâ fercum à magnete tactum : hoc notat contagium prolificum. Nec hîc ſubtilis vir requieſcit, verum poſtea in altiore gradu pedem figere videtur. Et fœminam ex conceptu Idææ generalis ſine materia impregnatam eſſe; & à ſimilitudine conſtitutionis cerebri & uteri, utriuſq; functionem ſimilem eſſe vult. Ut quemadmodum cerebro artificis ineſt ratio ſui operis & ſpecies immaterialis, ita utero inſit ſpecies ſive forma filius immaterialis, quæ ſit cauſa impregnationis. Hæc ſumma atq; ultima meta eſt, quam exercitationum ſuarum curſu contendere nititur, plura tamen ſunt, per totam operis ſeriem diſſeminata, quæ ſummus ille Philoſophiæ augur, rationibus, ex ipſius naturæ penetralibus petitis, quaſi quirinali lituo deſignat. Dum hæc perlegi veterum doctrinæ ita contraria, luctabantur tonſæ lento & difficili illo marmore : ſubſtiti pauliſper ſollicitus, donec ſtatui viri alicujus docti opem rogare. Cum protinus occurrebas tu, ut qui contra Philoſophia novatores ſtrenuum te exhibuiſti athletam. Rogatum igitur te venit hæc mea chartula, ut adjutes dubitantem, tuamq; de his, quæ apud me plurimum valebit, ſententiam aperias : Hæc ſi conceſſeris in omnes abſtringes gratias,

Verum eruditionis tuæ cultorem.

I. P.

Doctiſſimo Viro. *J. P.*

HEſterna nocte (vir eruditiſſimè, ſed ſolo literarum & candoris nomine mihi cognita) Epiſtolam tuam latio melle conditam accepi; in qua ſententiam meam requiris, quodnam judicium habendum ſit de clariſſimi Doctoris Harvæi *opinione in* Generatione Animalium. *Ego ſane non ſum neſcius meæ imbecilitatis quamq; impar ſit congreſſus; Achilli nihilominus veritatis præſideo fretus, animam aſſumpſi ut cum* Homero *loquar* ἐπιλαβόμεσθον, *& conatus ſum hæſitantes per flumen traducere; nam ſuaſu amicorum aggreſſus ſum Doctoris literatiſſimi opinionem eamq; ni fallor conferti pro meis viribus in tractatu illo Anglico quem nuperrime typis commiſi: ſcio plurimos eſſe me longe in doctrinæ laude præſtantiores (inter quos tu mihi videris non minimus) qui debebant hanc provinciam ſuſcepere; ſed cum adverterem omnes monomacheam hanc detractantes volebam potiùs me periculo exponere, quam alto ſilentio permittere, ut opinio talis apud noſtrates (qui quicquid novum eſt avide & ſine maſticatione deglutiant) hoſpitium haberet fortaſſe ſtomacha-bitur Doctor quod ego micantibus eruditionis ſuæ radiis, nebulam hac mea ſcriptione objicerem; & famæ ſuæ ſplendorem mea refutatione obfuſcarem; ſed pro ingemita viris doctis humanitate non ignorat in civitate libera debere linguas & pennas eſſe liberas, & oppugnandos errores à quocumq; Authore proceſſerint: amicitia enim veritatis Platonicæ & Socraticæ præferenda eſt. Ego me intra modeſtiæ limites continui,*

neque quidquam à mea penna lapſum eſt, quod poſſet illius famæ officere; neque ab omni errore liber eſſe poteſt, quamdiu homo eſt; ſi autem pergat hanc ſuam Helenam ulterius propugnare: Ibo animis contra vel magnum præſtet Achillem. *Interea autem vir doctiſſimè* quiſquis es haud equidem invitis cœleſtibus auras vitales carpis, *tibi meam ſententiam breviter aperiam, quum me tam humaniter compellas, Hæc opinio videtur & à religione & à recta ratione prorſus aliena, nam ſi maris ſemen uterum non ingrediatur, ſed fœmina tactu virtuali ſolum concipiat,* Iſaac, *& proinde Chriſtus non magis dicendi ſunt ſemen* Abrahæ; *quam ſolis, nam ſol contactu virtuali generat hominem, neq; poteſt ullus filius dici aut eſſe os de oſſibus, aut caro de carne parentū, quando mater ſemine careat patris autem ſemen uterum non ingrediatur. Hæc opinio tollit omnem amorem paternum: erga liberos omnemq; providentiam, quis enim pater ſollicitus erit hæreditatem illi relinquere quem ſcit non eſſe filium, quomodo autem filius dicendus eſt, qui ex ſubſtantia patris non eſt, (loquor hic de filio naturali, non adoptivo) quorſum creavit Deus marem & fœminam, quorſum utrumq; in arca conſervavit, ſi abſque maris ſemine concipere valet fœmina: vir non poteſt vocari adulter, nec ulli poſſunt generari in adulterio quum ſemen viri in uterum non recipiatur, cumq; quotidianum ſit ut fœmina abſque corporali tactu virilis ſeminis concipiat, quid miraculi fuit Chriſtum ſic concipi, quorſum honorandus eſt pater ex quinto præcepto ſi pater non ſit, quomodo autem pater eſt, qui non generat, & quomodo generat ſi ſemen in uterum non emittat? Simile autem quo utitur Doctor ſumptum à Magnete impertinens eſt: Nam dicit tactum ſpermaticum in coitu*

eſſe

esse virtualem, at cum ferrum tangitur à Magnete, ibi tactus est corporalis. Magnes etiam trahit corpus ferri, sic debet uterus semen si similitudo valet. Deinde Scire cupio utrum semen masculeum recipiatur intra matricem; an non si non? quo abit? cur etiam, aperitur matrix? ad recipiendam virtutem solum seminis sine corpore? nuga. Virtus non est corpus, non ergo opus est apertione, nulla namq; penetratio dimensionum erit, si ostium occludatur; si autem recipiatur semen ab utero, & tangat sanguinem menstruum; Tactus ille corporalis erit, non virtualis. Praterea in tactu virtuali, tangens, aut est spiritus, sic anima virtualiter tangit corpus, intelligentia cœlum; aut toto genere differt à re tacta; tale est cœlum quod tangit inferiora corpora virtualiter: At semen, nec est spiritus, sed corpus, nec genere differt à sanguine, quia ex sanguine fit, ergo non tangit virtualiter. Dices: Magnes tangit ferrum virtualiter; sed hoc nego, nullus enim est tactus illic nisi corporalis; fertur quidem acus ad magnetem, ingenita quadam vi, sicut lapis ad centrum; an ideo concludemus centrum tangere virtualiter lapidem? nihil minus. Sed si concederem esse virtualem contactum in Magnete, rogo, cui fini data est illa virtus, nonne ut fiat contactus corporalis videmus enim hæc corporaliter, se tangere nec contenta esse virtuali tactu; eodem modo semini data est virtus tangendi sanguinem in utero, ut realiter & corporaliter se tangant cum datur opportunitas. Debuit etiam, Dr. nobis ostendere, quanta mora requiratur, & quanta distantia, ad virtualem hanc actionem. Videmus enim ferrum & magnetem non se tangere nisi in debita distantia, idque absq; ulla mora, quomodo etiam fit, ut filius referat patrem vultu & moribus, si paternum

semen

ſemen, agat ſolum virtualiter. Si etiam ſeminis actio ſit ſolum virtualis, quid opus erat calore, humore aliiſque qualitatibus elementaribus? Virtualis quippe contactus fit ab occulta, non ab elementari & manifeſta qualitate. Deinde nulla fit conceptio niſi ſemen detineatur in utero, at illa detentio eſt preſentia corporalis non virtualis; nec ulla generatio dicenda eſt univoca ſi ſemen agat ſolum virtualiter; eodem enim modo generabitur homo quo mus virtute ſolis ex putrifactione. Sed inepte vocat ſpermaticum tactum contagium, eſt enim contagium morbus contractus ex contactu: At coitus non eſt morbus, quum nihil magis ſit ſecundum naturam. Cum autem dicit, Doctor feminam ex concepiu Idææ, generalis ſine materia impregnatam eſſe: videtur neſcire naturam Idææ quæ nil aliud eſt quam exemplar futuri opificii in mente opificis: exemplar autem nec eſt efficiens, nec materialis cauſa rerum, nam ſtatuæ efficiens eſt ſtatuarius materia lapis aut lignum aut metallum: forma eſt repreſentatio illius Idææ quam artifex in mente habuit, ſecundum ergo exemplar illud artifex introduxit formam ſtatuæ in materiam ope variorum, inſtrumentorum, non ergo fit filius materialis ex immateriali, ſed ex parentum ſemine & ſanguine, ad exemplar illud ſeu filium immaterialem non in utero ſed in cerebro, quod eſt propria ſedes phantaſmatum & Idearum ob organa apta & ſpiritus animales; neque enim ulla eſt ſimilitudo (ut putat Doctor) inter cerebrum & uterum ſive ſubſtantiam, ſive qualitates, ſive conſtitutionem, ſive operationes conſideremus; nam in cerebro producuntur Idææ & phantaſmata, in utero corporales ſubſtantiæ, in hoc eſt filius materialis in illo immaterialis; ſed hæc ſatis refutavimus in tractatu noſtro Anglico, quare

quar hic nolo tecum pluribus agere: Hæc sufficiant ut scias me nec vetis tuis deesse, nec humanitatis leges silentio meo violare voluisse; quare confestim vale, Vir literatissime & amicis sine fuco tui, omniumque qui veritatem amant antiquam, conatus boni consule;

April 24. 1652.

A. R.

FINIS.
